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NUCLEAR PROLIFERATION IN THE MIDDLE EAST:

Implications for the Superpowers

ROGER F. PAJAK

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NUCLEAR PROLIFERATION IN THE MIDDLE EAST:
Implications for the Superpowers

by

Dr. Roger F. Pajak
Associate Research Fellow
Research Directorate

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DEDICATION

To my beloved Lil

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FOREWORD

The growing possibility of nuclear weapons proliferation in the Middle East complicates an already unpredictable situation and intensifies the potential for catastrophic regional conflict and superpower involvement.

What would a nuclear-armed Middle East portend for superpower interests? In this first National Security Affairs Monograph of 1982, Dr. Roger F. Pajak sets out to answer this question. He examines several factors of importance to US policymakers: nuclear supplier policies, the current nuclear technology status of key Middle East countries, the Arab-Israeli conflict, nonproliferation controls and incentives, the specter of nuclear terrorism, and the role of Pakistan.

The author concludes that the nuclear powers—especially the superpowers—have common interests in reducing the potential for nuclear proliferation in the Middle East. Recognition of this fact suggests working toward a continuation and expansion of international controls, such as making the Middle East a nuclear-free zone. The author also explores the possibilities for US-Soviet interaction in the region, along the lines of pre-crisis consultation and joint action. While he does not minimize the difficulties, Dr. Pajak reminds us of the critical interests at stake that might suggest a policy of some superpower cooperation in this unique arena.

JOHN S. PUSTAY
LTG, USAF
President, NDU

ABOUT THE AUTHOR

Dr. Roger F. Pajak is National Security Adviser for Soviet and Middle East Affairs in the Office of the Secretary of the Treasury. He was formerly Senior Foreign Affairs Adviser with the US Arms Control and Disarmament Agency from 1971–80, serving as the Agency's senior specialist on Soviet, Middle East, and South Asian policy, Arab-Israeli affairs, and US security assistance policy.

Dr. Pajak received a BA degree in International Relations from Michigan State University, an MA degree in Soviet Area Studies from Harvard University, and a Ph.D. degree in International Relations and Soviet Area Studies from American University. He spent two years in the US Army as a Military Intelligence Officer from 1961–63, and has been with the US Government as a Soviet foreign affairs specialist since that time.

Besides speaking overseas on behalf of the US International Communication Agency, Dr. Pajak has lectured at the National War College, the Foreign Service Institute, the US Army Russian Institute, the Council on Foreign Relations, and at various universities. He is a widely published author on Soviet policy and military assistance (including *Soviet Arms Aid in the Middle East,* published by Georgetown University in 1976), as well as on West European arms sales policies and nuclear proliferation.

Dr. Pajak graduated from the National War College in June 1980. While at the War College, he also served as an Associate Research Fellow at the National Defense University Research Directorate, where he completed the research for this study.

PREFACE

The research for this study was largely completed while I was an Associate Research Fellow at the National Defense University Research Directorate. This respite from my day-to-day tasks was made possible by a year's leave of absence from the US Arms Control and Disarmament Agency. The program of study and research provided the opportunity to reflect on and expand my knowledge of national security policy formulation and foreign affairs, and for this I am grateful to the President of the National Defense University and the Commandant and faculty of the National War College.

During the academic year, I was also fortunate to have concurrently enjoyed the hospitality and facilities of the NDU Research Directorate. My affiliation as Associate Research Fellow provided me not only with the opportunity to undertake this study, but, more importantly, the companionship of intellectually stimulating colleagues. I am especially grateful to the Director of Research, Colonel Franklin D. Margiotta, for his kind counsel and support.

In addition to the Research Directorate editors and staff who directly helped in the preparation of this study, I wish to express my gratitude to Dale Oyster of the Nonproliferation Bureau of the Arms Control and Disarmament Agency, who offered valuable comments and insights on the manuscript draft.

Finally, and most importantly, I wish to acknowledge the patience and understanding of my wife, Lil, and my children, Mindy, Lisa, and Jeff, who tolerated my neglect and often lifted me from discouragement. Without their forbearance, the writing of this study would not have been possible.

Any shortcomings in the study are my own. The analysis and conclusions also are mine and do not necessarily represent the views of the National Defense University, the Department of Defense, or any other Government agency.

ROGER F. PAJAK

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EXECUTIVE SUMMARY

The diffusion of nuclear technology in the Third World and the possibility of nuclear weapons proliferation comprise one of the most acute security concerns confronting the US and its allies. Nowhere are the implications for world peace more precarious than in the volatile Middle East. In contrast to the US-Soviet political environment in which a nuclear "code of conduct" has developed, no such code of behavior exists in the Arab-Israeli milieu. A potential nuclear scenario thereby looms large in any renewed significant conflict in the Middle East, with the consequent implications for catastrophe in the area, as well as for superpower confrontation.

The political, military, and economic incentives which might impel a state to "go nuclear" clearly obtain for Israel and its primary Arab antagonists. Israel appears on virtually every list of would-be proliferators, while politico-military incentives and the requisite economic capabilities for obtaining a nuclear capability are undeniably present in several Arab states.

Many observers aver that Israel, despite official denials, already possesses nuclear weapons or can quickly make them available if necessary. The public statements of Israeli policymakers reflect the basic fear that Israel cannot afford to lose a war. From this belief flow the deepseated Israeli concern for security and unwillingness to foreclose the nuclear option. In this context, even hints of a nuclear capability provide many political advantages of an actual capability, with few attendant liabilities. Although the question of credibility of a perceived nuclear option would most definitively be demonstrated by an actual nuclear test, such an event might result in more negative than positive ramifications for Israel vis-a-vis US and world reaction.

On the Arab side, Iraq, Libya, and Egypt all have nuclear research programs in varying degrees of development. The most advanced of these capabilities, that of Iraq, was dramatically set back by Israel in a precision airstrike in June 1981 against the French-built nuclear reactor at Tuwaitha near Baghdad. The Israeli raid thrust the issue of proliferation into the public realm more vividly than any event since India's nuclear detonation in 1974. The raid dramatized the dangers to regional stability by even the *perceived* acquisition of a nuclear capability. While the destruction of the reactor set back Iraq's developing nuclear capability by several years, it concomitantly intensified overall Arab interest in acquiring such a capability.

Pakistan remains a potential source of nuclear-related technical assistance to the Arab states because of its relatively advanced research program and its existing network of political, religious, and military ties with the Arab peoples. Pakistan appears intent on combining an ambitious nuclear power program with the acquisition of facilities for a complete nuclear fuel cycle, which would enable it to produce the fissile material essential for a nuclear test. The burden of Pakistan's nuclear program on its fragile economy leaves open the possibility of Pakistan's sharing of nuclear technology with certain countries to capitalize on its costly investment.

The nuclear option continues to loom large in Israeli strategic thinking. Among the more plausible objectives for Tel Aviv are: to offset an Arab nuclear or conventional military capability, to maintain the regional status quo, to deter Soviet intervention, and to reduce dependence on the US. Israel's Arab antagonists may harbor similar objectives, but limited Arab technical capability to date precludes more than academic allusion to such goals. The possibility of nuclear terrorism in some form, however, bodes increasingly real as time passes.

For the existing nuclear powers, eliminating the potential of nuclear proliferation is a difficult but critical undertaking. The nuclear powers, in conjunction with the International Atomic Energy Agency, must continue to act in concert to maintain incentives as well as controls to dissuade potential proliferators, to prevent the erosion of safeguards, and to reinforce international norms against proliferation. In this respect, even the Soviets have tended to act responsibly, having sought to restrict the transfer of nuclear technology among their friends and clients.

A crisis involving proiiferation in the Middle East carries with it the potential of superpower involvement. Whether such a crisis would result in increased superpower cooperation or heightened confrontation would depend on the existing state of the Soviet-US dialogue, the commonality of superpower policy toward proliferation, and pre-crisis recognition of the critical importance of consultations and possible joint action designed to thwart the threatened or actual brandishment of nuclear weapons by a would-be proliferator.

CHAPTER 1
A CRITICAL ISSUE

The proliferation of nuclear weapons technology among countries of the Third World has developed into a critical national security issue for the entire civilized world. Observers in the field grimly predict that, unless the diffusion of nuclear technology is arrested, a world of possibly 20 or more nuclear weapon states may emerge by the year 2000.

Nowhere are the implications for world peace and security more precarious than in the Middle East, already perhaps the most volatile region in the world. The increased political and military destabilization, confrontation, and potential for conflict resulting from a nuclearized Middle East are starkly apparent.

In contrast to the US-Soviet political-military environment in which policy, rhetoric, technology, and communication provide important elements in a common "code of conduct" for nuclear behavior between the two superpowers, no such code of behavior exists in the Arab-Israeli milieu. Not only is such a code lacking, but the post-World War II history of the area includes four wars and is replete with terrorism and reprisals. Furthermore, almost no significant formal or informal relationships exist between Israel and any of the Arab states except, to some degree, with Egypt. At the same time, increasingly persuasive evidence indicates that nuclear weapons may already be present in the region, while existing capabilities to deliver nuclear ordnance have continued to multiply. The plausibility thereby exists of a nuclear weapons scenario in any renewed large-scale conflict in the Middle East, with the consequent implications for catastrophe in the area, as well as confrontation between the superpowers.

This paper will first examine the policies of the United States, the Soviet Union, and the London nuclear supplier countries vis-a-vis the export of nuclear technology to Middle East states, highlighting differences among these policies. The study will then delineate the motivations, planning, and efforts of Israel and the Arab states directed at the acquisition of nuclear technology. It will also analyze Israeli

and Arab perceptions of the nuclear option, and will discuss and assess various policy measures which the United States might consider to forestall or hinder the acquisition of nuclear weapons by states in the area. The paper will conclude with a discussion of the implications for US-Soviet relations of nuclear proliferation in the Middle East.

It is self-evident that the fluid nature of the Middle East political-security environment makes it difficult and hazardous to deal with a topic as dynamic and open-ended as nuclear proliferation. Nevertheless, it is hoped that this analysis of the Middle East nuclear scene, as it exists at the beginning of 1982, will contribute to some understanding of this complex and portentous problem with all of its attendant consequences for superpower relations and world security.

CHAPTER 2

INCENTIVES AND COSTS OF A NUCLEAR CAPABILITY

INCENTIVES

The incentives which may lead a Middle Eastern or other developing country to acquire a nuclear weapons capability are basic, relatively apparent, and interrelated. These can be broadly characterized as national security, foreign policy, economic, and domestic considerations. Each country which opts for the costly and technically demanding nuclear weapons acquisition process will do so for its own reasons, based upon circumstances unique to it. At the same time, a set of common incentives can be quite confidently identified as providing the essential basis for choosing a nuclear option.

National Security/Deterrence

The most fundamental incentive for a state to acquire nuclear weapons is to deter external powers from attacking and destroying the existing governmental system. The fear of inadequate conventional military strength to defend its independence and national territory provides a particularly strong incentive for a nuclear capability. A country such as Israel appears on virtually every list of would-be proliferators, in large part due to its fear of a combined and overwhelming conventional attack by its regional adversaries. On the part of some Arab states, military incentives are a factor in the planned acquisition of nuclear weapons, most dramatically illustrated in the case of Libya, with its stated desire of annihilating Israel. Another type of concern is exemplified in the case of Pakistan, which is fundamentally concerned with threats to its security from a nuclear-capable neighbor.

A country also may be concerned with its geographic isolation and fear that its long-term security may be deteriorating. Such factors could generate efforts toward acquiring a nuclear capability as a

means of offsetting such deterioration or providing a means of last resort to preserve a state's existence. Consequently, the more vulnerable a state perceives itself to be, the greater its interest in going nuclear. Furthermore, not all threats need emanate from immediate neighbors. An advantage of nuclear over conventional weapons is that they can be efficiently delivered on a long-range basis. Nuclear arms thus may be construed as great equalizers, allowing smaller countries to effectively deter or influence larger or stronger powers.[1]

For some nonnuclear states, guarantees of support by a major power have provided some degree of protection in the past. Such guarantees, however, are in the process of losing, or already have lost, their credibility. As existing alliances and security guarantees continue to weaken, internal pressures may motivate some states to acquire their own nuclear capability as a substitute.

Increased Influence and Prestige

A nuclear capability is commonly perceived as a symbol of modernity, technological sophistication, and international status. In a world of concentrated power, wealth, and technological expertise on the part of a minority of advanced, industrialized powers, the majority of the world's countries must vie for economic independence and a place in the sun. A nuclear capability can serve to enhance national self-confidence, win respect from neighbors and world powers, and engender fears in regional rivals.[2]

Aside from symbolizing independence and autonomy, a nuclear weapons capability tends to impart enhanced power and prestige to a state in the international arena. The nuclear powers in their own right have done nothing to denigrate the importance of their nuclear arsenals as political and military instruments of high utility. It is no coincidence that the permanent members of the UN Security Council are all nuclear weapon states. It is therefore quite natural for national leaders seeking to augment their countries' influence in the international community to be tempted by the avowed prestige benefits of nuclear weaponry.

Enhanced Status

Along with such symbols of modernity as computers and space vehicles, nuclear weapons, since 1945, have come to be regarded as the cutting edge of technological prowess. The increasing asser-

tiveness of the OPEC states and other members of the Third World in the continuing North/South confrontation will inexorably have an impact on the global distribution of military power. As Third World states continue to develop economically, internal pressures to acquire a nuclear capability have been generated in tandem. In the eyes of developing countries sensitized to eradicating the dichotomy between "haves" and "have nots" in the economic area, the categories of nuclear and nonnuclear states serve as further evidences of discrimination. The absence of a nuclear weapons capability is perceived by some as relegation to permanent second-class status, with "going nuclear" thus viewed as involving a rightful redistribution of power and a necessary accompaniment to redistribution of economic resources.[3]

Economic Considerations

As a corollary to the striving for status on the part of many developing states, economic concerns may engender additional pressures toward nuclear proliferation. Some developing states with burgeoning economic interests may conclude that the protection of such interests requires augmented military capabilities, including nuclear weapons. Paradoxically, the very success of some Third World development programs can thus generate incentives toward proliferation as strong as those provided by existing economic frustrations.

Some countries exhibit interest in developing a peaceful nuclear industry because of the potential spinoff benefits accruing to the military sector. Even as such states avow no present intention of going nuclear, they retain the reassuring feeling that in developing their nuclear industries they are acquiring a nuclear option in the event the time ever comes when the latter might be needed. With problems posed by energy, poverty, and population likely to intensify in the future, the incentives provided by a nuclear option in greater bargaining leverage with the industrial countries is likely to increase.[4]

Domestic Political Requirements

In addition to the basic security and economic concerns discussed above, additional internal pressures may reinforce proclivities to keep open a nuclear option. Besides serving to enhance a country's international status, a nuclear capability can bolster a government's domestic political standing. Indeed, domestic political fac-

tors may more acutely impel a decision to acquire nuclear weapons than international concerns. A government's inability to solve pressing economic or social problems may serve as a tempting inducement for the political leadership to develop and flaunt nuclear weapons to divert popular attention away from societal problems, as well as to solidify popular support for the government. Displaying nuclear weapons, even more than aircraft fly-bys or national day military parades, admirably serves nationalistic requirements. It is widely believed that such domestic needs were important in India's decision to test a nuclear device.[5] As a final consideration, the benefits of a nuclear program could include inducing the retention of scientists and skilled specialists who otherwise might be tempted to emigrate to countries with more attractive scientific establishments.

NOTE: The reader at this point should note that the remainder of Chapter 2 is a somewhat technical discussion of the requirements, costs, and various facets of a nuclear development program. The nonspecialist reader, should he choose, may wish to skip this section and proceed directly to Chapter 3.

TECHNICAL REQUIREMENTS AND COSTS OF NUCLEAR WEAPONS ACQUISITIONS

At the current stage of technology in the world, the theory of a nuclear weapon is simple; combine a sufficient amount of any one of several fissile materials to form a critical mass. If this material is concentrated quickly enough, the energy released by the spontaneous chain reaction splitting of the atoms will result in an explosion. For example, a mass of man-made plutonium can be constructed just below its "critical mass." An additional amount of plutonium can then be fired, like a bullet, into the first mass. If the total amount is equal to or greater than the critical mass, and if the velocity of the "bullet" is sufficient, a nuclear explosion will result.[6]

While the theory is commonly known, the actual construction of a nuclear weapon is far from simple. To fabricate nuclear weapons, two crucial ingredients are necessary. One is the fissile material, uranium or plutonium of sufficient enrichment or purity. The other is people with necessary engineering training and skill.[7]

The explosive substance in a nuclear fission weapon (as distinct from a hydrogen or thermonuclear weapon) is either plutonium-239

or uranium that has been enriched in the isotope uranium-235 or uranium-233. About 5 to 10 kilograms of plutonium are required for a fission weapon, compared with 15 to 30 kilograms of U-235.[8]

Inasmuch as the fissile isotope, U-235, constitutes only 0.71 percent of the natural element, the bulk of natural uranium consists of the U-238 isotope, which is not fissionable. The latter isotope can be enriched, through physical separation techniques, until it is of weapons-grade quality (more than 20 percent U-235), but this process is a very expensive undertaking.[9]

Uranium can be enriched by one of several methods. The most successful to date has been the gaseous diffusion process, developed by the World War II Manhattan Project. This type of facility has remained essentially the only source of enriched uranium for civilian and military programs in the United States and in foreign countries since that time. Gaseous diffusion plants are not only inherently sprawling structures utilizing a sophisticated technology, most of which still remains classified, but in addition demand an enormous investment of capital and consume voracious amounts of electricity. In addition, they cannot be concealed. The gaseous diffusion route to nuclear weaponry simply remains out of the question for all but a handful of the most highly developed countries.

High-speed centrifuge technology for uranium enrichment is a method that was investigated during the Manhattan Project and later abandoned, but it has recently emerged as a more economical method than gaseous diffusion. Centrifuge enrichment thus exists as a reasonable choice for some developing countries.

Another method is the German-developed Becker nozzle process. Besides requiring a large number of stages, however, this method consumes over twice as much electric power as gaseous diffusion, and 30 times as much as centrifuges. The only attractive feature of this process is that it is wholly unclassified. This method accordingly does not constitute a reasonable choice for a small or developing state.[10]

Several other processes presently under development, including laser technology, promise to reduce substantially the cost of enriching uranium. Not having been proven in practice, however, they do not yet constitute available options for developing nations.

Plutonium-239, not a naturally-occurring substance, is manufactured from the natural U-238 isotope in a nuclear reactor. The newly produced plutonium-239 can then be "reprocessed," or separated chemically from the uranium. Inasmuch as nearly all nuclear power reactors currently operating in the world contain large amounts of U-238, these reactors are automatic producers of plutonium-239. Thus, even peaceful power station reactors produce plutonium that can be extracted from waste by-products and transformed into weapons, but only if separated in a chemical reprocessing plant. A typical American light water reactor in a nuclear power plant generating 1,000 megawatts of electricity produces about 250 kilograms of plutonium-239 annually.[11]

The process of plutonium production is not inexpensive, but it is less expensive and less demanding than enriching uranium to weapons-grade quality, and, more importantly, can be done on a smaller scale. Moreover, the growing number of nuclear power reactors in industrialized, as well as Third World, nations continues to make available increasing amounts of plutonium with attendant risks of diversion.[12] The process of chemically separating plutonium out of the spent U-238 reactor fuel will shortly be within the industrial capability of most nations, especially if foreign technical assistance is available.[13] The International Atomic Energy Agency (IAEA) previously estimated that by 1980 the daily addition to the world's stock of nuclear fuel materials would be sufficient to produce 10 nuclear weapons a day.[14]

With plutonium-producing reactors currently in operation in several developing states, the question remains how difficult it would be for additional countries, lacking major technological bases, to construct their own reactors. The problems to be solved in such a situation closely parallel those faced by the United States in the Manhattan Project, with two important exceptions: (1) the relevant reactor technology is now highly developed and readly accessible in public literature; and (2) many important materials unavailable during World War II can now be purchased on the open market.[15]

For a country choosing to embark on a nuclear development program, cost would be a significant obstacle to overcome. Critical factors affecting the cost estimate would be the availability of a trained scientific and skilled manpower pool, the technological and industrial base, and available material resources. Leonard Beaton estimated in

1966 that a $450 million investment over a 10-year period would be required to support a minimal nuclear force of five bombs a year. This included $100 million for enriching uranium to fuel grade (3–5 percent of U-235), a reactor, and a chemical separation plant. Beaton's estimate for a modest program of more sophisticated weapons and a delivery system was from $230 to $310 million annually over a 10-year period. Finally, he estimated the cost of the British nuclear weapons program at $300 million per year and the French at $336 million per year over a 20-year period.[16]

Many countries already have nuclear power reactors currently in operation or under construction. Should such a country later decide to follow the plutonium route toward acquiring a weapons capability, additional funding would be necessary only for a reprocessing plant, a weapons laboratory, some initial research and development costs, and a delivery system. The cost of a rudimentary nuclear development system—assuming a reactor is already available—was estimated at $350 to $400 million in 1976.[17]

While costs for a complete weapons program remain formidable for a typical developing country, most Middle East states would not be cost-constrained. Moreover, the incremental costs of plutonium-producing facilities would probably not be dissuasive for an Arab state. The diffusion of nuclear technology and increasing availability of plutonium have substantially reduced the cost of weapons development. The Office of Technology Assessment (OTA) estimated in 1977 that a reactor capable of producing sufficient plutonium for one or two bombs annually could be constructed in about 3 years at a cost of $15 million to $30 million. OTA further estimated that a small reprocessing plant to chemically separate plutonium from the spent fuel of a reactor could be built at a cost below $25 million.[18]

Notwithstanding the fact that the fabrication of nuclear weapons remains a complicated and costly undertaking, a substantial number of Third World states possessing only a modest technological capability now have the potential of constructing and operating small plutonium production and reprocessing facilities. Only countries having a relatively high level of technical capacity would realistically be able to embark on an ambitious production program of 10 to 20 weapons annually. According to OTA, a large reactor and reprocessing facility could be built in 5 to 7 years and operated by 200 to 275 engineers and technical specialists at a cost of $175 million to $350 million.

ALTERNATIVE PATHS TO A NUCLEAR CAPABILITY

At least four basic paths can lead toward the acquisition of a nuclear weapons capability:

(1) An overt governmental decision to produce nuclear weapons is the most efficient course. The five nuclear powers all opted for this choice, designing appropriate facilities as they proceeded.

(2) Covert, surreptitious diversion of nuclear materials from IAEA-safeguarded, peaceful programs offers a possible choice, but this is an unlikely method as it would necessitate keeping a weapons program secret for years.

(3) Withdrawal of material from unsafeguarded facilities is another highly likely path (apparently used by India) but requires a long leadtime unless an indigenous enrichment or plutonium recycling capacity is available.

(4) The theft of another country's nuclear weapons stationed on one's territory is a highly implausible, but not impossible, scenario.[19]

It is commonly believed that until the 1990s plutonium will remain the principal nuclear weapons material available to Third World countries. Involved in the plutonium route to potential nuclear arms are five steps: obtaining uranium ore, manufacturing fuel elements, operating a reactor, extracting plutonium from spent reactor fuel, and producing a weapon. To be completely independent, a nation would require the resources for all five of these steps, but shortcuts could be achieved by foreign technical assistance at one or more of these stages. The entire process could be rapidly facilitated if the first four steps, comprising the nuclear fuel cycle, were bypassed by the purchase or other acquisition of plutonium.[20]

Whether plutonium or uranium is chosen as the route to nuclear weapons production, uranium ore is necessary, and relatively few countries possess significant deposits. Aside from the Communist states, only the United States, Canada, Sweden, South Africa, and Australia possess the ore in major amounts, although about 20 other countries have smaller deposits. The United States, which remains the primary exporter of uranium, employs strict controls to prevent

diversion of it to weapons use. However, US predominance in the uranium export market has diminished as other suppliers have developed new enrichment techniques.

The costs and technical requirements associated with nuclear weapons acquisition do not end with the fabrication of a weapon or even a test detonation of an explosive device. To be militarily significant, the weapon must be deliverable. The nuclear-capable country thus requires some type of delivery system which is both reliable and credible in the eyes of regional adversaries, usually meaning either modern attack aircraft or a missile system.[21]

For technical and cost reasons, practically all would-be nuclear proliferators in the developing world would probably rely on aircraft as their first means of nuclear delivery. While many Third World countries—including most Middle East states—already possess some nuclear-capable aircraft in their conventional force structure,[22] to ensure penetration of an enemy's airspace, a minimum of two to four aircraft would be required for each primary target. Such a margin would allow for a preemptive attack on the part of an adversary as well as anticipated operational losses. These considerations tend to denigrate the popular notion of the delivery of a single bomb by a commercial jet or a fighter bomber. A single aircraft carrying a bomb accordingly would have little deterrent value. Credibility arises from forces in being or realistically anticipated. At the same time, since governments rely heavily on future planning, even a token capability may possess disproportionate influence because a country facing a threat tends to evaluate present realities in terms of future probabilities.[23]

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CHAPTER 3

NUCLEAR SUPPLIER POLICIES

US NONPROLIFERATION POLICY

Since the advent of the nuclear age in 1945, the United States has striven to follow a policy designed to minimize the antithetical aspects of peaceful nuclear energy and destructive atomic weapons. The policy has alternated from a striving for complete secrecy, to the sharing of nuclear technology, to serious concern over the consequences of proliferation.

In late 1945, the United States promulgated a nuclear "secrecy policy" designed to prevent other countries from acquiring any information on atomic energy. A component of this policy was a joint US-British-Canadian declaration whereby the three countries agreed to prohibit the transfer of nuclear information until the establishment of an international system of control.[1]

Congressional passage of the Atomic Energy Act of 1946 went even further than Truman administration policy. One result of the legislation was to force cessation of cooperation with Great Britain and Canada, despite their wartime assistance in nuclear research.

In the same year the United States proposed an international system of atomic energy control known as the "Baruch Plan." The essence of the plan was twofold:

- Creation of an International Atomic Development Authority to be entrusted with all phases of the development and use of nuclear energy, and
- Cessation of the manufacture of atomic weapons and their subsequent disposal in congruence with international renunciation of such armaments and establishment of a control system.[2]

The Soviet Union rejected the plan and countered with a "ban-the-bomb" approach. The Soviet draft convention called for prohibition of all production of nuclear weapons and for destruction of such

armaments within 6 months after signing of the convention. Although negotiations continued for several years on the Baruch Plan and Soviet counterproposals, irreconcilable differences between the two sides made it impossible to reach agreement on a nuclear control scheme.[3]

By late 1953 it became manifest that the "secrecy-denial" policy had failed. Great Britain had exploded a nuclear weapon and both the United States and the Soviet Union had tested thermonuclear (hydrogen) bombs. The United States thereupon shifted its policy from denial of information to promotion of the peaceful aspects of nuclear research. In a December 1953 speech to the United Nations, President Eisenhower inaugurated the "Atoms for Peace" program, whereby the United States stood ready to make available to cooperating countries the peaceful applications of nuclear energy "as widely as expanding technology permits."[4] The program required that safeguards be instituted to prevent diversion of nuclear equipment and materials from peaceful to military purposes. To administer and implement such safeguards and otherwise promote the peaceful application of nuclear technology, the International Atomic Energy Agency (IAEA) was created in 1957 at the urging of the United States, despite early Soviet objections.

One of the unfortunate and unintended consequences of the "Atoms for Peace" program was an obfuscation of the distinction between peaceful and military applications of nuclear technology. Some of the same equipment and materials utilized in peaceful pursuits of the atom can be harnessed, to varying extents, in weapons research. Thus, technology derived from the development of nuclear power reactors lowered the technological barriers to the acquisition of nuclear weaponry. Following the entry of France and China as members of the nuclear club in the early 1960s, major international efforts to prevent further nuclear proliferation clearly were essential. The objective of preventing the further diffusion of nuclear weapons—the third phase of US nonproliferation policy—was codified into the Non-Proliferation Treaty (NPT) which was signed in 1968 and entered into force in 1970.[5]

Despite the nonsignature of two nuclear powers at the time (China and France) and a number of potential weapons states, the NPT was a seminal milestone in international nonproliferation efforts. An initial group of 98 countries was disposed to sign the treaty, with nonnuclear weapon states agreeing to forego such weapons in re-

turn for a promise by the nuclear states to share peaceful nuclear technology. The nonweapons signatories moreover agreed to place *all* their atomic facilities under IAEA safeguards.

For the following several years, the proliferation problem appeared quiescent. The abundance of cheap oil dominated the energy picture, peaceful nuclear energy seemed less enticing than it had in the 1950s, and the number of nuclear weapons powers stabilized at five, following the Chinese nuclear test in 1964.

This international complacency disintegrated in 1974 under the impact of two events. One was India's "peaceful" nuclear detonation, using plutonium extracted from a research reactor supplied by Canada, in violation of the 1950-vintage Canadian safeguards agreement. The other occurrence was the Arab oil embargo and the accompanying quadrupling of oil prices, causing worldwide perturbation vis-a-vis energy supplies. Disruption in the oil flow not surprisingly precipitated a resurgence of interest in nuclear energy.[6]

The net result was to reinvigorate many countries' plans for the early commercial use of plutonium fuel, especially through the use of breeder reactors. Unfortunately for nonproliferation efforts, however, plutonium—unlike the low-enriched uranium commonly used as reactor fuel—is a weapons-usable material. Ironically, man-made plutonium is unlikely to become an economically superior fuel to uranium because of the former's high processing cost, unless and until shortages or much higher prices of uranium ore occur. However, plutonium reprocessing plants in some cases were offered to countries which were just beginning uranium-fueled reactor programs and which evidenced no justification for reprocessing.

In the face of these developments, the Ford administration undertook several important policy measures in 1975-76. It induced the nuclear supplier governments to begin discussions leading to a "code of conduct" for nuclear exports. Then in late 1976, as the US presidential election campaign focused attention on nuclear exports as an issue, President Ford announced a moratorium on US commercial reprocessing of spent fuel, pending the results of further study.[7]

The nuclear export and nonproliferation policies of the Carter administration reflected an apparent heightened concern over the possible spread of nuclear weaponry. The administration announced

several steps which it hoped would serve as examples and inducements for other countries to emulate. In April 1977, the Carter White House extended the previous administration's prohibition on commercial reprocessing and reduced funding for the US breeder reactor program. In addition, the United States voluntarily opened all its nonmilitary nuclear facilities to IAEA inspection, despite US exemption from such inspections allowed by the NPT.[9]

Washington concurrently made renewed efforts to influence foreign suppliers and recipients alike to adopt strengthened nonproliferation policies. During the London supplier negotiations, the Carter administration pressed the other exporting states to broaden the "trigger list" of nuclear items automatically invoking safeguards and, at the same time, pushed for a ban on the export of reprocessing technology. Despite initial recalcitrance, both the FRG and France acquiesced in such a ban on future exports.

The United States focused direct pressure on several suppliers to eliminate potential proliferation-worsening arrangements perceived as especially critical. After France—following the West German nuclear facilities deal with Brazil—concluded the sale of a reprocessing plant to South Korea in 1976, Washington forced Seoul to cancel the arrangement. The United States also caused the Japanese to modify plans for the Tokai Mura reprocessing plant, so that it would not produce weapons-grade plutonium in the near future. Another major breakthrough for the Carter administration occurred in August 1978 with the French cancellation of arrangements for a reprocessing plant in Pakistan, following intense US pressure on both parties.

To supplement its use of the "stick" in its nonproliferation policy, the United States concurrently broadened the "carrot" of incentives and assurances to countries adhering to nonproliferation policies. Washington recommended establishing an international uranium fuel bank to moderate fluctuations in supply for uranium buyers and, it hoped, to decrease incentives for countries to build their own reprocessing facilities. The United States also offered to receive and store foreign nuclear wastes in the further hope of heading off the foreign reprocessing of such wastes. At the same time, the Carter administration proposed to develop alternative fuel cycles designed not to produce weapons-grade material. Related to this measure was strong US encouragement for the launching of a 40-nation, 2-year study and dialogue on the future of nuclear power—the International

Nuclear Fuel Cycle Evaluation (INFCE). Finally, despite controversy over safeguards, the United States resumed supplying nuclear fuel to India, which it had suspended following the 1974 Indian nuclear explosion, as a demonstration of US reliability as a supplier of nuclear weapons for peaceful application and as a means of forestalling further Indian fuel cycle development.[9]

The remaining element in the US nonproliferation repertoire was congressional enactment of the Nuclear Non-Proliferation Act of 1978, signed into law by President Carter 10 March 1978. The legislation delineates criteria which must be adhered to by any potential buyer of US nuclear materials before American companies can receive an export license for a sale. A nonnuclear weapons state purchasing nuclear material must:

- Accept IAEA safeguards for all its nuclear facilities following renegotiation of existing contracts;
- Guarantee not to produce nuclear armaments from the purchased materials;
- Agree not to re-export any materials provided without prior written permission from the US Government;
- Promise not to reprocess or enrich US fuel to more than 20 percent without prior US consent; and
- Guarantee the physical security of materials.

The act further stipulates that all nuclear trade between the United States and a nonweapons country will immediately cease if the purchasing party detonates a nuclear explosive or violates a safeguard agreement.

As stringent as these criteria may appear, they are far more subdued than some provisions in an earlier version of the bill. One provision sought to deny US exports to any nation engaging in reprocessing or enrichment, regardless of the source of the technology and materials. The existing legislation generally embodies administration philosophy and reflects the shift in policy since 1977—i.e., moving away from pressures on other suppliers and recipients and restrictions on US participation in the international nuclear market, and toward incentives for nations supporting US policies.[10]

SOVIET NONPROLIFERATION POLICY

Although both Moscow and Washington have exhibited some generalized concerns regarding proliferation, the Soviet approach to the problem has been more narrowly delineated. Against the backdrop of the Sino-Soviet schism, the Soviet leadership in the 1960s recognized that would-be proliferators in that period shared two common denominators: political hostility to the Soviet Union and geographical proximity to either Soviet territory or that of Moscow's clients. Two states loomed particularly threatening from the Soviet perspective: the Federal Republic of Germany and China.

In Soviet eyes, the potential menace of a nuclear-armed Germany probably posed the most foreboding threat. Soviet propagandists had concentrated on Bonn's alleged nuclear ambitions ever since the late 1950s. The Rapacki and Gomulka Plans for the "denuclearization" of Central Europe were early phases in Moscow's diplomatic campaign to avert West Germany's possible acquisition of a nuclear potential.[11]

Soviet participation in the Geneva talks leading to the draft nuclear Nonproliferation Treaty (NPT) in 1967 achieved a number of positive results for Moscow. First of all, occurring at a time when detente was just beginning to influence the course of East-West relations, Moscow's participation in the negotiations served to enhance the image of the USSR as a responsible major power, as well as a co-equal with the United States. Not only was the 1967 draft nonproliferation treaty a joint US-Soviet document, but the Geneva sessions of the 18-Nation Disarmament Committee, in which the treaty was negotiated, were co-chaired for the first time by the United States and the Soviet Union. Also important from Moscow's perspective was the impact of the treaty negotiated on the debates within NATO on establishment of a Multilateral Nuclear Force and on the related question of West Germany's nuclear status.[12]

While the initial signing of the NPT in July 1968 was a major event for Soviet diplomacy, an even more significant Soviet objective was achieved in November 1969 with the accession of West Germany to the treaty. Unfortunately for Moscow, the prevention of a Chinese nuclear capability—the second prime Soviet objective—already lay beyond the range of the NPT. Moscow's expectations nevertheless remained that the Treaty would at least contribute

to forging a common Soviet-US "containment" of China and further the isolation of China on the world scene.

Furthermore, from the Soviet perspective, the NPT bore another key virtue: it placed an uneven political and diplomatic burden upon the United States. In the international milieu of the 1960s, there was no possibility that Moscow would allow any of its client states to challenge Soviet authority by establishing an independent nuclear program—completely aside from the NPT. Apart from the "renegade Chinese revisionists," no Soviet ally would dare to entertain such ambitions. The only conceivable appetites for a nuclear program then lay in the "imperialist camp." Consequently, the NPT regime created by the Treaty in effect made the United States the "lonely policeman of proliferation," and concurrently offered Moscow the prospect of opportunities for divisive diplomacy.[13]

At the same time, numerous Soviet statements on the issue of proliferation have contended that further nuclear diffusion would seriously endanger international security and undermine movement toward an accommodation on strategic arms. The magnitude of the threat was underscored, for example, in a *Pravda* editorial in May 1968, where commentator Yuri Zhukov wrote:

> The danger of proliferation of nuclear arms is becoming more real every day . . . . At least ten countries in addition to the existing nuclear powers have, or soon will have, the capability of producing nuclear bombs. Between this year and 1970 these ten countries, should they so desire, could produce 1,000 bombs per year.[14]

An indication that resolution of the proliferation problem would have to precede any further movement on arms control was signalled by an article in *Izvestiya* in July 1968 when Moscow was first exploring strategic arms limitation talks with the United States. The article called for "the broadest support by the governments of all continents for the nonproliferation treaty. Progress in the field of disarmament will depend, above all, on this."[15]

This interplay of strategic and political factors appeared to warrant Moscow's commitment to nonproliferation as an important foreign policy priority. As other actors on the world stage, however, the Soviets had manifold policy interests and aspirations. Since the advent of the NPT, various political-strategic calculations have influenced or outweighed those factors tending to support a strong

nonproliferation policy. Over the past decade, Moscow has not always taken an unequivocal position against threats to proliferation. On occasion, it has deemphasized the security concerns of those nonnuclear states whose adherence to the treaty remains important to its success, and it looked the other way when India—an important arms client and trading partner—detonated a nuclear device in 1974. Soviet competition with China for influence in the developing world, political and economic commitments to other states, and an unwillingness to constrain its own nuclear program for concessions by other countries have all affected Soviet attitudes toward nonproliferation.[16]

Soviet statements opposing the spread of nuclear weapons have frequently implied that proliferation is *not* generally reducible into individual categories of relative "acceptability." The most fundamental objection which Moscow has raised against proliferation derives from the Soviet belief that any expansion of the nuclear club "would greatly aggravate international tensions and increase the possibility of these monstrous weapons of mass destruction being brought into play."[17] In support of such pronouncements, Soviet spokesmen have advanced several lines of reasoning. Perhaps the most common has been their suggestion that, at a minimum, the general availability of nuclear weaponry would increase the probability that such weapons would actually be used—either by accident, miscalculation, or irrational impulse—with unpredictable risks and consequences.

Moscow accordingly has joined the United States and the United Kingdom in attempting to prevent further proliferation by its accession to the NPT and its support of international safeguards. For a panoply of political and strategic reasons, the Soviet leadership has viewed an anti-proliferation stance as useful to its policy goals.

Perhaps the most critical of these has been forestalling the development of additional independent nuclear forces that could have a catalytic role in igniting local conflicts possibly leading to a superpower confrontation. Limited wars in Soviet military doctrine generate a momentum of their own and may easily result in escalation. While Moscow does not have to be seriously concerned over the possibility of a direct threat to its own security from any current nuclear threshold state, it wants to assure that a stable nuclear situation will continue to obtain between the superpowers.[18]

The noncompliance of China in the NPT has been used by Moscow to help isolate China in the world community and to gener-

ate Third World support for Soviet foreign policy. The Soviet Union at the same time has periodically called for the participation of all nuclear states in comprehensive disarmament measures, including a World Disarmament Conference. The Soviets have eschewed bilateral or limited approaches—which may be more practical—because they offer, in the words of a Soviet writer, "military and political advantage to some countries at the expense of others . . . . At present it would be most expedient to continue with efforts to get all countries without exception to discontinue nuclear explosives."[19]

The Soviet position on proliferation then has reflected ambiguities, as well as inconsistencies. While advocating nuclear weapons-free zones in various regions of the world, Moscow did not sign the Latin American Treaty of Tlatelolco—a 1967 treaty prohibiting nuclear weapons in that area—until 1978. In a similar vein, Moscow has refused to open even its non-military nuclear facilities to IAEA inspection, and the Soviets are progressing toward a plutonium economy, while continuing to ask other states to accept international safeguards inspections and forego nuclear reprocessing and enrichment activities.

Despite these anomalies, it would be unfair to conclude that Moscow has acted irresponsibly in the nuclear proliferation area. Soviet conduct in this sphere has moved toward increasing responsibility vis-a-vis proliferation. The bad taste in their mouths from their former cooperation with China probably has induced greater caution on the part of Soviet policymakers in any nuclear cooperation ventures. At the same time, the primary restraining factor on the Soviets no doubt is the realization that further proliferation would adversely impact on the security of the Soviet Union and its allies.[20]

LONDON NUCLEAR SUPPLIERS GROUP

Supplementing the formal framework of US nuclear dealings with Europe under the NPT Treaty and a set of US bilateral cooperative agreements are the informal arrangements of the Nuclear Suppliers Group. The supplier nations, at US initiative, had been meeting in London since the mid-seventies in efforts to prevent the competitive dilution of safeguards applied to nuclear exports. In January 1978, the 15 supplier states[21] simultaneously submitted to the IAEA a "statement of guidelines" for nuclear exports containing some 16 provisions relative to exports of items on a sensitive "trigger list," including:

(1) Adequate physical protection for exported equipment;

(2) IAEA safeguards to be applied to all transferred items, as well as to any replication of sensitive technology.

(3) Extension of export controls to any retransfer of originally-supplied items or items derived from them, with the original suplier's consent required for major items;

(4) Consent of the supplier nations and notice to the IAEA for use of transferred technology to produce uranium enriched to more than 20 percent;

(5) Support for IAEA safeguards; and

(6) Design of equipment to facilitate safeguards.[22]

Each supplier's statement to IAEA is a nonbinding, unilateral action which can be withdrawn or modified at will, although the possibility of a supplier's diluting of the existing guidelines appears unlikely. In fact, the opposite tendency has been the case. Canada, for example, became the first supplier to announce that it would require recipients of its nuclear exports to have ratified the NPT or to accept full fuel cycle safeguards. In another dramatic policy change, France in December 1976 announced a ban on all future exports of nuclear enrichment and reprocessing technology and equipment. For a time, the question of implementing the French agreement to provide a reprocessing plant for Pakistan remained open but, in mid-1978, the agreement was abrogated by Paris (see section on Pakistan below).[23]

PERCEPTIONS OF THE NONNUCLEAR STATES

In succinct terms, the nuclear "have not" countries that have thus far refused to accede to the NPT have adhered to that stance because (1) these states are not prepared to renounce the nuclear option without a more credible and definitive security guarantee by the nuclear powers; (2) they are convinced that existing or potential regional threats to their security demand a modicum of military self-sufficiency; and (3) they suspect that the nuclear powers are attempting to have the best of two worlds by denying others access to the nuclear option, while maintaining their own nuclear arsenals. Because of the understandable insistence of the "have-nots" on equity

and reciprocity, they are not persuaded of the efficacy of submitting to measures of self-denial, without some concomitant quid pro quos on the part of the nuclear states. A common lament by many developing states, both signatories and nonsignatories of the NPT, is that the superpowers, for all of their avowed interest in preventing nuclear proliferation, have failed to exhibit any meaningful self-restraint in acquiring nuclear weaponry themselves.[24]

The concerns of the nuclear "have-nots" pose complex policy difficulties insofar as possible alleviation by the major powers is concerned. First of all, while the NPT offers signatories assurances against nuclear attack, no guarantees are tendered regarding conventional attack, the threat most feared by most of the "have-nots." Secondly, while the latter states are the most likely candidates for proliferation, the nuclear powers have relatively little leverage available for dissuading the "have-nots" from going nuclear. The most likely nuclear states in the Middle East already are affected in varying degrees by diplomatic isolation, unfavorable publicity, and economic sanctions and have therefore relatively little to lose by going nuclear. Finally, possible efforts on the part of the major powers to dissuade the would-be proliferators from proliferating may be in conflict with other policy objectives including oil import needs, desire for trade markets, and policy toward Palestinian self-determination and a general Middle East peace settlement.[25]

CHAPTER 3 ENDNOTES

1. Richard Burns, *Salt, Nonproliferation, and Nuclear Weapons-Free Zones: An Introduction*, Occasional Paper No. 6 (Los Angeles: California State University Center for the Study of Armament and Disarmament, 1979), p. 42.

2. US Congress, OTA, *Nuclear Proliferation and Safeguards* (Washington: Government Printing Office, 1977), p. 4.

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8. Gloria Duffy and Gordon Adams, *Power Politics: The Nuclear Industry and Nuclear Exports* (New York: Council on Economic Priorities, 1978), p. 65.

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11. Walter F. Hahn, "Nuclear Proliferation," *Strategic Review*, Winter 1975, pp. 21-22.

12. Toby Trister Gati, *Soviet Perspective on Nuclear Nonproliferation* (Santa Monica, Calif.: California Seminar on Arms Control and Foreign Policy, 1975), p. 2.

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14. *Pravda*, May 26, 1968, as cited in Roman Kolkowicz, et. al., *The Soviet Union and Arms Control: A Superpower Dilemma* (Baltimore: Johns Hopkins Press, 1970), pp. 73-74.

15. *Izvestiya*, 3 July 1968, cited in *Ibid.*, p. 74.

16. Gati, pp. 2-3.

17. "An Important Aspect of Disarmament, "*International Affairs* (Moscow), No. 1, January 1967, p. 67, as quoted in Kolkowicz, p. 77.

18. Gati, p.1.

19. V. Viktorov, "Ten Years of the Moscow Treaty," *International Affairs* (Moscow), September 1973, p. 36, as cited in Gati, p. 3.

20. Paul E. Zinner, "The Soviet Union in a Proliferated World," in John Kerry King (ed.), *International Political Effects of the Spread of Nuclear Weapons* (Washington: Government Printing Office, April 1974), p. 105.

21. The original seven suppliers—the United States, Great Britain, France, West Germany, the Soviet Union, Canada, and Japan—subsequently expanded their membership to include Belgium, Italy, the Netherlands, Sweden, Switzerland, East Germany, Poland, and Czechoslovakia.

22. Library of Congress, Congressional Research Service, *West European Nuclear Energy Development: Implications for the US*, report prepared for the Committee on Foreign Relations, US Senate (Washington: Government Printing Office, June 1979), p. 38.

23. *Nuclear Proliferation and Safeguards*, p. 74.

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CHAPTER 4

NUCLEAR STATUS AND POLICIES OF THE MIDDLE EAST COUNTRIES

IMPORTANCE OF CIVILIAN COVER FOR MILITARY RESEARCH PROGRAMS

While a civilian cover for a military research program, especially a nuclear research operation, is unnecessary for the Western powers, such cover would be highly useful for countries in the Middle East. Israel serves as a dramatic example. An openly-avowed Israeli nuclear weapons program would stimulate comparable efforts on the Arab side and add to political problems with the United States, perhaps leading to a decrease in material and political support. Such a development could also result in augmented Soviet military support. Some observers and commentators have advocated a publicly-declared Israeli reliance on a nuclear deterrent but this view has not been espoused by the Israeli government.[1]

On the Arab side, cogent arguments also exist for secretiveness and ambiguity. The Arabs, to begin with, have a distance to go in acquiring a nuclear capability. A dearth of trained scientific and technical experts will necessitate a lengthy training program and other long leadtime activities. The continuing tendency of the Arab states to be wracked by political divisions also will tend to slow technological progress. A publicly-announced nuclear development program, followed by years of little apparent progress, would lack credibility. Some Arab governments might also fear sanctions or other pressures on the part of Western countries, which would complicate the formers' access to Western technology and equipment.[2]

NUCLEAR OVERVIEW OF THE MIDDLE EAST

As Table 1 indicates, in the mid-to-late 1980s, a number of Middle East countries could possess some degree of nuclear capability.

Nuclear reactor construction plans of various Middle East states are indicated in Table 2.

There are no open indications that any Middle East country presently plans the construction of chemical separation plants for the production of highly enriched uranium. At the same time, Israel is

Table 1
POTENTIAL NUCLEAR CAPABILITIES OF MIDDLE EAST STATES

	1975	1980	1985
1. Assimilation of basic theoretical knowledge of fission	Egypt; Libya; Saudi Arabia	Libya; Syria	--
2. Nuclear power plants under construction or planned	Iran; Iraq; Kuwait	Egypt; Iraq; Kuwait; Saudi Arabia	Egypt; Libya; Syria
3. Operation of nuclear power plant(s) and start of nascent nuclear infrastructure	—	—	Kuwait; Saudi Arabia
4. Effective access to significant quantities of divertible fissile material from civilian nuclear fuel cycle	—	—	Iraq
5. Capability to build small plutonium production reactor (2 bombs/year)	—	—	Egypt; Iraq; Libya(?); Syria(?); Saudi Arabia(?)
6. Capability to build larger plutonium production reactor (20 bombs/year)	Israel	Israel	Iraq(?); Israel
7. Demonstrated uranium enrichment capability	Israel(?)	Israel	Israel

Source: Cited in Lewis Dunn, ed., *US Defense Planning for a More Proliferated World* (Hudson Institute; Croton-on-Hudson, N.Y., 1979), p. 69. Copyright © 1979 Lewis Dunn, Hudson Institute. Reprinted by permission.

Table 2
STATUS OF NUCLEAR REACTOR CONSTRUCTION

Egypt

Research reactor

WWR-C-Cairo	2 MWe	1961	10% enriched uranium

Power reactor

Two 600 MWe reactors have been under negotiation for several years with Westinghouse (with a letter of intent having been signed for one); this deal has been delayed by lack of Congressional approval. The first is scheduled for completion in 1985.

Iraq

Research reactors	2 MWe	in operation	10% enriched uranium
Osiris type (under construction by France with Italian participation)	70 MWe		93% enriched uranium
Power reactor			
600 MWe (apparently under negotiation with France)	PWR	late 1980s?	3% enriched uranium

Israel

Research reactors

IRR-1	5 MWt	1960	90% enriched uranium
IRR-2	26 MWt	1964	natural uranium

Power reactors

None on order. A 950 MWe light water reactor for completion in mid-1980s is under negotiation with various supplier states. If unable to import one under conditions it deems acceptable, officials assert Israel may build one of its own design.

Kuwait

Research reactors

None.

Power reactors

None. Government expressed interest in four to six 600 MWe dual purpose units by year 2000, starting in the late 1980s.

Libya

Research reactors

None.

Power reactors

300 MWe (negotiated with the USSR)—dual purpose: power and desalination
600 MWe (under discussion with France)—PWR

Syria

Research reactors

None.

Power reactors

None planned. Syria is contemplating a feasibility study for a 600 MWe nuclear power plant.

Note: MWe = megawatt (electric); MWt = megawatt (thermal); PWR = pressurized water reactor.

Source: Joseph Yager (ed.), *Nonproliferation and US Foreign Policy* (Washington: Brookings Institution, 1980), pp. 206–208. Copyright © 1980 The Brookings Institution. Reprinted by permission.

reported to be engaged in basic research on laser isotope separation. Moreover, new uranium enrichment centrifuges are under development in the United States, Europe, and Japan. Not only can centrifuge enrichment technology be utilized efficiently on a small scale, but it can readily be switched from the production of low-enriched uranium fuel to weapons-grade material. All in all, Israel's technological lead gives it a substantial edge over the Arab states in this area, with the latter having a long way to go in such things as the training of skilled manpower and the development of a supporting infrastructure.

Israel

The Israeli nuclear development program—which is in a class by itself among the Middle East states—has been the subject of discussion, speculation, and conjecture among scholars, observers, and journalists for some 2 decades. From a careful reading of the public press, it appears that the consensus among observers is that "Israel has reached a point of maturity in nuclear technology and has acquired the capability to assemble, if necessary, fissionable material into weapons."[2] Some writers, of course, have gone even further in characterizing the advanced state of Israeli nuclear preparations. The Government of Israel, meanwhile, has maintained an official silence in the face of all such reports. One may suggest that rumors of a nuclear capability may not altogether be adverse to Israeli interests. Former Premier Shimon Peres is said to have stated some time ago that it is not in Israel's interest to dissipate Arab fears.

Many of the voices which command the attention of the Israeli public today regarding the nightmare of a nuclear calamity in the Middle East are largely those that formerly pressed for the rapid development of a nuclear deterrent, despite the possibility that Israel could not hold a nuclear monopoly for long. The issue was debated forcefully in Israeli circles in the early 1960s and before. It may be worthwhile to recapitulate the flavor of recent past events concerning the nuclear option in Israel before focusing on the current situation.

Israeli interest in the nuclear field dates back to the founding of the state in 1948, when Israeli nuclear scientists began extracting low grade uranium from phosphate deposits in the Negev Desert. With the encouragement of Chaim Weizmann, Israel's first president, Israeli scientists shortly thereafter reportedly perfected a technique for producing heavy water. In exchange for information on this process, France in 1953 permitted the Israelis to study its own nuclear research program. The French subsequently invited Israeli scientists

to participate as observers in their nuclear weapons testing in the Sahara Desert.[3]

Throughout the 1950s and into the early 1960s, Israel and France maintained a close cooperative relationship, with France serving as nearly sole provider of military equipment and high technology items to Israel. Most significantly, France in 1957 provided the Israelis with their first nuclear reactor—a 26 mega-watt unit located at Dimona in the Negev—and concomitantly assisted in designing the research facilities associated with the reactor. By the time the reactor went critical in 1964, a heated policy debate was underway in the Israeli Government on the direction to take in nuclear weapons development.

The Israeli decision itself to build the Dimona reactor was actually taken in 1957 in the aftermath of the Suez War of October 1956. Despite its spectacular military success in rapidly occupying the Sinai Peninsula, Israel was pressured by Washington and Moscow to withdraw from the conquered territory without any political settlement or guarantees, except for the stationing of a UN force in Sharm-el-Sheikh and the Gaza strip. The Israelis saw themselves isolated and faced with a US arms embargo, while the Arabs were engaged in a rapid military buildup, supplied by Moscow.[4]

Israel was left with France as its sole provider of military assistance. This relationship was nurtured by a certain "community of interests" which existed between the two countries at the time. France was faced by the Algerian revolt, which was sustained by Nasser. He, in turn, was regarded by Israel as its arch-enemy for his advocacy of total war by the Arab world against the Jewish state. French-Israeli cooperation carried over into the scientific realm where France sought Israeli expertise in nuclear physics in development of a *force de frappe*. The Israelis for their part welcomed all assistance they could acquire in the way of weapons and equipment.

The Israeli leaders also were mindful that their victories to date were attained not only because of the heroism, motivation, and technical proficiency of their armed forces and populace, but also were partly due to the lack of unity, cooperation, and technical sophistication of the Arabs. The realization that over the course of time the Arab world would gradually increase its military potential and narrow the technological gap with Israel was a specter that constantly haunted the Israeli leadership.

In this context, two schools of strategic thought emerged in Israel. The first was aptly characterized by Moshe Sharett, Foreign Minister and Prime Minister, as follows:

> The one approach says that the only language the Arabs understand is force. The State of Israel is so tiny and isolated ... that if it does not increase its actual strength by a very high coefficient of demonstrated action, it will run into trouble. From time to time, the State of Israel must give unmistakable proof of its strength and show that it is able and ready to use force in a crushing and highly effective manner. If it does not give such proof, it will be engulfed and may even disappear from the face of the earth.

The second approach, one of maximum restraint, maintained that the question of peace should be kept in constant focus, with retaliation for acts of sabotage curbed, so as not to contribute to escalation of the conflict.[5]

In the competition for predominance among these two doctrines, the proponents of the first, accepting a continuation of conflict, won out and determined Israeli policy until 1963. Within this genre evolved a concept of "interceptive war," or deterrence, as the only response to Israel's vulnerability and defense requirements. This strategy was formulated by Yigal Allon, former Deputy Prime Minister, who did not conceive of a nuclear deterrent, but insisted on keeping open a peace option involving neutralization of the Middle East and a nonaggression pact between the two sides.

This strategy, however, was interpreted differently by Moshe Dayan, Shimon Peres, and Ben Gurion, the prime designers of the French-Israeli alliance which predated and antedated the 1956 Suez War. This alliance nurtured the adoption of the French doctrine of nuclear deterrence as the only means of offsetting Arab superiority in manpower and quantities of conventional arms.

In 1957, at the recommendation of Prime Minister Ben Gurion, the Israeli Cabinet approved the construction of the Dimona reactor. The existence of this facility did not become publicly known until disclosed by Ben Gurion in December 1960 in response to a request by US Secretary of State Christian Herter to clarify rumors that Israel was building a plutonium-producing reactor capable of nuclear weapons production.[6] After initially claiming that the installation was a textile plant, Israel and France admitted that they were engaged in a cooperative nuclear program, including the construction of a natural uranium reactor. Ben Gurion emphatically denied allegations that Israel was producing a nuclear weapon and insisted that Israeli efforts

were devoted exclusively to peaceful purposes.[7] Needless to say, such reassurances did little to calm anxieties that arose in the Arab countries and elsewhere in the world following disclosure of the news.

Concerns in Israel itself were intensified when news was leaked that six of the seven members of the Israeli Atomic Energy Commission, nominated by the Minister of Defense in 1952, had resigned in disagreement over policy. These resignations left only the chairman, Dr. D.E. Bergman, remaining on the commission. In followup, at the end of 1961, a Committee for the Denuclearization of the Israeli-Arab conflict was formed by prominent scholars and scientists. The committee regarded adoption of a nuclear option as a fundamental mistake and demanded that Israel seek the denuclearization of the Middle East. These objectives met with considerable sympathy from among the public and some leading members of the major political parties.

Considerable debate over the nuclear option ensued in the Knesset, with the leader of the Mapam Party calling for a nuclear-free zone in the Middle East. In rejecting such plans as irrelevant to the threat posed by the conventional arms race in the area, the Israeli Government stated:

> There are no nuclear weapons in the Middle East and Israel will never be first to introduce them. But Israel can be destroyed by conventional weapons and therefore the stress should be laid on conventional disarmament in the world and in the region.[8]

This official position was to be repeated again and again.

The "nuclear option" policy of Ben Gurion placed increasing strain on Israel's relations with the United States and contributed to internal political dissension within Israel. In June 1963 Ben Gurion resigned and was succeeded by Levi Eshkol. While Eshkol also declined to endorse a plan for a nuclear-free Middle East, he did move—under pressure from the United States and from within Israel—farther from Ben Gurion's and from his original position. Assured of maintaining Israeli arms levels by direct United States military sales, Eshkol agreed to limit operations at Dimona to a specified level, while retaining the right to reexamine the situation and hold open the nuclear option should the conventional arms balance change adversely vis-a-vis Israel.

Arab Reaction from Anxiety to Reassurance

While Arab reaction to Israeli nuclear activities at the time was an intensification of the conventional arms race, the problem continually held center stage in discussions within and among the Arab governments. The Arab leaders were plagued by perplexing questions regarding the Israeli nuclear option. Was an atomic bomb a figment of Israeli propaganda? Did Israel really have the capability of manufacturing such a weapon? Would such a capability force the Arabs to come to terms with Israel? What could the Arab countries do in response?

The Arab press vacillated among various postures, at times disparaging Israeli capabilities, sometimes underscoring Arab capacities to counter the threat, or grandiloquently exaggerating ostensible Arab nuclear programs. Egypt, clearly the leading power of the Arab world, appeared to conclude that it could do little immediately in its own right to develop its own nuclear option. President Nasser thereupon sought a response in the political arena, calling for the perseverance of political pressure against Israel and the consolidation of Arab unity. The absence of a military reaction was immediately criticized by other Arab leaders, who had been predisposed to fight to the last Egyptian, but Nasser had little choice but to adhere to his nonmilitary response to the continuing nuclear program in Israel.

In August 1965, the influential Egyptian journalist, Hassinein Heykal, wrote in *Al-Ahram* on the nuclear danger posed by Israel. "Israel is close to the capacity to explode an atomic device," he stated, "and will in two or three years be close to the capacity to produce atomic weapons." Heykal foresaw Israel as taking this course because of her inferior position in a conventional arms race, her increasing isolation, and her militarist mentality. Substantial prestige would accrue to her "atomic status," as would the ability to overcome the growing gap in favor of the Arabs in terms of population, economy, and military potential. Heykal urged the Arabs not to allow Israel to "intimidate or worry us, otherwise we just walk into the trap Israel wants us to walk into." He called for a new "Arab strategy," without explaining what it should be, except to hint: "There is one reason why Egypt must be prepared to introduce nuclear arms: her will to live."[9]

Shimon Peres, who had formerly served as Deputy Defense Minister before resigning when his party split away from the Labor Party,

expressed some satisfaction over Heykal's concerns in a *Jerusalem Post* article on 26 August 1965. "The very fact that Dr. Heykal entertained the suspicion that Israel was capable of manufacturing nonconventional weapons is a *political-fact* which it pays to ignore." Adhering in fact to his belief in a "psychological deterrent," Peres did not attempt to allay Heykal's suspicions, but instead proposed a "demilitarization of hatred based on the status quo."

Despite Peres' lack of reassurance to Heykal's concerns, a change did occur in the Arab political mood by late 1965 in the toning down and lessening of hysteria concerning an Israeli nuclear weapon. Nasser is reported to have stated that, "If Israel proceeds with an atomic bomb, then I believe the only answer to this is a preventive war." As no visible war preparations followed, it seems to indicate that Cairo did not believe Israel was producing such a weapon. Arab propaganda treatment in this period referred only rarely to Israeli nuclear potential. Syria and the PLO furthermore maintained that nuclear weapons were useless against guerrilla operations. The behavior of the Arabs at this time may indicate some perception that Israel would refrain from exercising her nuclear option. The change in policy of the Eshkol administration may have played a role in this development.[10]

Incentives and Disincentives of a Nuclear Posture

Prior to 1967, antinuclear circles in Israel advanced several key arguments against the acquisition of a nuclear capability, as follows:

(1) Fears of a preventive war by the Arab states, as evidenced by the repeated threats by Nasser;

(2) The possibility that an Israeli bomb would impel the Soviets, or even the Chinese, to furnish some Arab states with nuclear weapons, which might tempt the latter to strike Israel preemptively;

(3) The converse of the above factor—i.e., the possibility that Israeli possession of a bomb might cause the superpowers or the United States alone to pressure Israel to renounce nuclear weapons and submit to international inspection;

(4) Concerns that a nuclear deterrent would be useless against limited frontier clashes or terrorist activities.[11]

The Six-Day War of June 1967 and its aftermath, however, weakened the major disincentives to nuclear weapons development. The failure of such a conclusive victory as that attained in the June war to achieve the Israeli objective of persuading the Arabs to negotiate suggested that a long haul was in store for Israel. The withdrawal of French materiel support also underscored the danger of depending on outside powers. These developments served to enhance the case made by proponents of the nuclear option, which included the following arguments:

(1) Conventional Israeli military superiority did not preclude the outbreak of another war;

(2) With both sides now receiving practically the latest types of conventional military equipment currently in production, both parties may be approaching a qualitative ceiling, with the implication that the arms race may continue mainly on a quantitative basis to the eventual detriment of Israel;

(3) The rather limited possibility of an Arab preemptive attack designed to strike Israeli nuclear facilities;

(4) The realization that opting for nuclear status may be the optimal means for decreasing the increasing dependence on the United States—and resulting potential US leverage—as Israel's sole major source of arms supply;

(5) The unlikely possibility of any of the Arab states being able to produce or acquire nuclear weapons of their own over the next several years;

(6) Even should an Arab state somehow acquire a nuclear capability, the belief that the presence of a large Arab population within Israel would inhibit a potential Arab surprise nuclear attack;

(7) The belief that a regional nuclear balance would likely result, after some period of increased tensions, in a renunciation of war as a policy alternative because of the realization of the awesome destructive power of nuclear weapons;

(8) The introduction of nuclear weapons in the region would likely bring forth superpower guarantees to stabilize the status quo, particularly since superpower intervention to avert the con-

sequences of proliferation would be supported by world opinion.[12]

In the aftermath of the 1967 war, it becomes even more difficult to separate fact from fiction in the history of Israeli nuclear development. According to some accounts, Prime Minister Eshkol, Mrs. Golda Meir, and former Foreign Minister Allon had curtailed plans for a nuclear weapon in 1968. However, unconfirmed reports indicate that Defense Minister Moshe Dayan had secretly ordered the weapons development project to continue, without higher government approval. When faced with the project half completed in 1969, the Cabinet supposedly approved continuation of the program. While not necessarily resulting in the actual construction of bombs, this process at least provided Israeli scientists with shortened production techniques.[13]

In any case, the facilities at Dimona have remained totally unsafeguarded. Several US officials and scientists were reported to have visited the installation in the early 1960s, without reporting any evidence of weapons development, but this was prior to or just after the reactor went critical. No Americans have been permitted to fully inspect the reactor since 1969. Even direct requests from visiting groups of US Congressmen to visit the facility have been politely refused.[14] The tight security surrounding Dimona was further illustrated in 1973, when the Israelis shot down a Libyan airliner which strayed off course and approached the restricted area, with the loss of 108 persons. Moreover, an attempt reportedly was made to shoot down an American high altitude reconnaissance aircraft which subsequently overflew the site.[15]

There is little doubt that the Israelis have had the necessary technical expertise to build a nuclear weapon, as was discussed earlier. Israel also has been fortunate to have available some supplies of natural uranium, which is extractable as a by-product from phosphate deposits in the Negev. Since the early 1970s, an estimated 40-50 tons of uranium oxide has been produced annually.[16] In addition, unconfirmed reports indicate that the Israelis have managed to "procure" between 200 and 400 pounds of weapons-grade uranium from a US firm in Apollo, Pennsylvania.[17]

The 26-MW thermal, heavy water reactor at Dimona is believed capable of producing approximately 8 kilograms of plutonium annually.[18] Roughly 5 kilograms of weapons-grade plutonium is required

for the production of a Hiroshima-yield weapon. If the reactor has been devoted solely to the production of weapons-grade plutonium since 1964, observers estimate that sufficient fissionable material has been produced to manufacture perhaps as many as 20 weapons in the 20-kiloton range.[19]

A point worth noting here is that a chemical separation plant is normally necessary to extract the plutonium produced in a reactor. There is no evidence of the existence of such a facility in Israel. Furthermore, a separation plant by its very nature would be nearly impossible to conceal or camouflage. At the same time, some observers believe that substitute separation facilities exist at the two reactor facilities in the form of "hot laboratories," equipped for remote-control processing of irradiated materials. But it is further believed that the small-scale operation of these facilities would militate against sustaining a nuclear weapons production program. Such reported anomalies have made it difficult to arrive at a clear-cut interpretation of the capability of the Israeli nuclear program.

Even US Government requests to Israel for clarification of the nuclear issue have not gotten far. One example dates back to 1969, when the Johnson administration was considering the first sale of F-4 Phantom fighter bombers to Israel. When discussing the NPT issue in this context, the Israelis went only as far as saying that they would not be the first to introduce nuclear weapons into the Middle East. In elaborating on this allusion, Israeli Ambassador Rabin indicated that he "understood" the Israeli position to be that Israel would not be the first to "test" such devices or publicly reveal their existence. An Assistant Secretary of Defense, Paul Warnke, sent a letter to Rabin specifying what the US position on nonintroduction of nuclear weapons meant—namely, no *production* of a nuclear device. Before the issue could be resolved, President Johnson curtailed the US bureaucracy's search for a substitute for the F-4s, and shortly thereafter announced the sale of 50 of these aircraft to Israel.[20]

The question remaining to be addressed is: Does the Middle East stand at the brink of a renewed conflict with one or both sides possessing a nuclear capability? Nearly all accounts dealing with the issue maintain that Israel, despite continued official denials and known technical problems, already possesses nuclear weapons or can quickly take the final steps in their fabrication. As early as July 1970, the *New York Times* reported that US policy in the Middle East was being conducted on the presumed basis that Israel either pos-

sessed an atomic weapon or "has component parts available for quick assembly."[21] The reports that aver such an Israeli capability emanate from such diverse sources as President Sadat, Yassir Arafat, the Soviet newspaper *Moskovskii Komsomoletz*, *Time* magazine, and the Central Intelligence Agency.

Sadat, on many occasions, has stated that Israel has atomic weapons.[22] Similarly Arafat has referred to reliable reports from "our own sources inside Israel" that, by 1975, Israel already had at least 3 to 5 bombs.[23] Soviet press claims to that effect also have been referred to in US newspaper accounts.[24] *Time* reported in April 1976 that 13 nuclear warheads were "hastily assembled at a secret underground tunnel during the 78-hour period at the start of the 1973 October War and ... were sent to desert arsenals where they remain today, still ready for use.[25]

The CIA itself has figured prominently as a source as well. At a briefing for newsmen on 18 March 1976, Mr. Carl Duckett, the Agency's Deputy Director for Science and Technology, was quoted as saying that Israel had from 10 to 20 nuclear weapons "ready and available for use."[26]

In January 1978, the CIA disclosed that it had concluded as early as September 1974 that Israel had produced nuclear weapons. This judgment was "based on Israeli acquisition of large quantities of uranium, partly by clandestine means, the ambiguous nature of Israeli efforts in the field of uranium enrichment, and Israel's large investment in a costly missile system designed to accommodate nuclear warheads."[27]

Other open sources could be cited to buttress the point, but the salient factor to note is the widely-held perception in the Middle East and elsewhere in the world that Israel is a nuclear power or a "screwdriver's turn" away from being one. A March 1976 poll taken in Israel indicated that 62 percent of the population believed that their country already possessed nuclear weapons, with only 4 percent thinking it did not. Moreover, 77 percent of the people thought that Israel should possess such weapons.[28]

In the meantime, the Israeli position on the question of nuclear weapons in the Middle East has not changed appreciably over the years. In 1968, Prime Minister Eshkol admitted that Israel possessed

the technical knowledge of how to produce nuclear arms, but that she remained a long way from applying that knowledge. In December 1974, Israeli President Katzir stated that Israel now possessed the "know-how" and that weapons could be produced in a "reasonable period of time."[29] He went on to state that:

> It has been our intention to provide the potential for nuclear development. We now have that potential. We will defend this country with all possible means at hand. We have to develop more powerful and new arms to protect ourselves.[30]

When Prime Minister Rabin was interviewed on British television for amplification on Katzir's comments, Rabin denied that Israel was a "nuclear power." Although he reiterated that Israel would not be the first to introduce atomic weapons into the area, he added that "we can't afford to be the second either."[31]

Former Foreign Minister Moshe Dayan echoed a similar position in July 1980. Dayan declared that if Israel is ever faced with destruction it would tell its enemies that they faced destruction too. "We never said we won't use atomic weapons," he stated. "We only said we wouldn't be the first to use them."[32]

Dayan commented further on Israel's nuclear capability in June 1981, stating that "We don't have any atomic bomb now, but we have the capacity, we can do that in a short time." He added, "We are not going to be the first ones to introduce nuclear weapons into the Middle East, but we do have the capacity to produce nuclear weapons, and if the Arabs are willing to introduce nuclear weapons into the Middle East, then Israel should not be too late in having nuclear weapons too." Dayan's comments were believed to be among the most explicit statements on Israel's nuclear capacity by an Israeli holding or having held a position of authority.[33]

Rabin's and Dayan's remarks reflect the basic fear, omnipresent with Israeli policymakers, that Israel cannot afford to lose a war. Unlike the Arab states, who can continue to lose wars and still remain viable nations, the Israelis must always win. Thus, their constant concern for security, and their basic aversion to foreclosing the nuclear option. In this context, even hints of a nuclear capability have immense utility. The more credible such hints become, the more they serve to provide many of the political advantages of an actual capability, with few attendant liabilities.

The question of credibility of a perceived nuclear option obviously could best be demonstrated by an actual Israeli nuclear test. However, such an event, which would definitively categorize Israel as a nuclear power, might result in more negative ramifications for Israel than positive (see discussion in Chapter 5).

In this context, enter the widely-reported, but still unconfirmed, mysterious atmospheric "explosion" near South Africa on 22 September 1979. On that date, a US Vela surveillance satellite, passing over an area of ocean between South Africa and Antarctica, detected an intense burst of light in the atmosphere. After a month of study, the United States initially announced that a "low-yield nuclear explosion" had occurred.[34]

Immediate speculation centered on South Africa as the likely perpetrator of the nuclear test. However, CBS News reported in February 1980 that Israel may have been involved, perhaps with the cooperation of the South African government. It was also reported that the CIA had indicated Israel and South Africa as the leading candidates for the explosion, as well as admitting the possibility of a joint undertaking to conduct a weapons test. CBS News claimed that its information was based on the draft of a book by two Israeli journalists, scheduled for publication in Israel, but then banned from publication by the Israeli military censor. The news network further claimed that South Africa first offered Israel the facilities to test a nuclear weapon in 1966, but that Israel had declined the offer until 1979, when "the Israeli military had to know if its bomb worked."[35]

Israeli Defense Minister Ezer Weizman denied the CBS report. An Israeli spokesman quoted Weizman as saying that, "nothing like that took place." In addition, the spokesman reiterated Israel's standard denial that it possessed nuclear weapons.[36] South Africa similarly denied the report as "ridiculous."[37]

A State Department official commented in the same vein, saying that "no corroborative evidence" existed that Israel was involved in a nuclear explosion. He added that the United States was unable to conclude that the September occurrence was a test.[38]

On 15 July 1980, a panel of scientists appointed by the White House reported, after extensive deliberations, that the mysterious flash of light was "probably not" a nuclear explosion. While the panel

admitted that it could not be certain what caused the phenomenon, it concluded that the flash detected by the Vela satellite most likely was light reflected from debris from the satellite itself after it was possibly struck by a small meteorite or piece of space debris. This possibility, according to the scientists, "appears to be the best candidate for a nonnuclear origin of the signal."[39]

The issuance of the panel's findings did not end the controversy by any means. Only the day prior to the announcement of the panel's conclusions, Department of Defense sources stated that the Defense Intelligence Agency had reached exactly the opposite conclusion, as did the US Naval Research Laboratory—that the flash probably resulted from a clandestine nuclear explosion.[40]

The scientific evidence from the September event certainly was mixed. While the satellite's readings matched the usual pattern of a low-yield nuclear blast, other corroborating evidence—such as nuclear fallout, seismic signals, or other satellite readings—was absent.[41] One bit of corroborative evidence was a reported chance sighting that evening by a sophisticated radio observatory at Arecibo, Puerto Rico, of a "ripple" in the ionosphere moving in a northerly direction from where a blast may have occurred. This phenomenon could have been caused by a tropical storm or similar natural event, but it was reportedly a calm evening.[42]

Military analysts conceded that the satellite readings were not corroborated by most of the other visual evidence of a nuclear blast, but they maintained that similar results were also true of certain French and Chinese tests. They also believed that the perpetrators of the possible test carefully chose the remote area of the South Atlantic and a cloudy night to disguise a test.[43]

Speculation continued to center on Israel as the nation testing the suspected nuclear device, possibly with South African assistance, because of the close relationship of the two countries for some years. Indeed, some observers have claimed that the two nations have had even more compelling political-military reasons for drawing closer together recently as they both have become more isolated as "pariah" states on the world scene.[44]

As with so many other elements in the Israeli nuclear question, the possibility of an Israeli test having occurred in September 1979 still remains just that. Nevertheless, the Israelis may feel an increasing proclivity—because of self-perceived strategic reasons—to

move more closely to the nuclear "line of no return," reasons to the contrary notwithstanding. And, in the words of former Israeli President Katzir in the nuclear context: "The world should worry."[45]

Egypt

Egypt's sole nuclear reactor is a small two-megawatt device built with Soviet assistance, and located at Inchass, near Cairo. A light water type, using 10 percent enriched uranium fuel, it went critical in 1961.[46] The reactor is not subject to IAEA safeguards, but the Soviets had controlled the disposal of the spent fuel produced at the facility.[47] In any case, the reactor is not capable of producing sufficient weapons-grade material for a bomb.

Egypt attempted, with little success, to further develop her nuclear research capabilities in the 1960s. The Egyptians did receive some technical assistance from India, where some scientists were sent for training. A reported attempt to contract with France for a 200-megawatt power reactor in 1963 ended unsuccessfuly, as did attempts to purchase a similar type from other European states, the United States, and China later in the decade. The difficulties facing Egypt in this regard were (1) the lack of a technological infrastructure, (2) the lack of scientific manpower, (3) the high costs involved, and (4) disagreements over control of the plutonium to be produced.[48]

Egypt was not any more successful in attempts to acquire nuclear weapons themselves. Cairo reportedly made repeated requests to the Soviet Union during the 1960s for such weapons, but Moscow refused. When the Egyptians then tried China, the latter admonished Cairo to rely on its own resources.[49]

Although press reports and rumors of an Israeli nuclear capability had become fairly widespread during the 1960s, the Egyptian efforts at galvanizing joint Arab action to counter, or even acknowledge, the reported Israeli capability met with little more than cursory reactions on the part of other Arab governments. It was even suggested that Israel itself was spreading such rumors to frighten the Arab states. When the subject of an Israeli nuclear capability was initially placed on the agendas of meetings of the Arab league and of the Arab chiefs of staff in the early 1960s, the topic apparently was far from uppermost in the minds of Arab decisionmakers.[50]

Egypt ranks as one of the scientifically most advanced states in the Arab world. An estimated 500 Egyptian nuclear scientists and

technicians work at the Nuclear Research Center at Inchass and at the Atomic Energy Organization in Cairo. Egyptians are active in international scientific forums and some hold senior positions in the IAEA in Vienna. While Egypt has the technological potential to become a nuclear power, it lacks the equipment and resources to implement a sustained nuclear program.[51]

Cairo's ambiguous response to Israel's nuclear potential was reflected for a time in Egypt's equivocal position on the NPT treaty, which it had signed, but not ratified. Egypt finally announced its intention to ratify in early 1981.[52] In its decision Cairo hoped to focus additional international pressure on Israel to forsake its nuclear option, while concurrently creating an image of Egyptian reasonableness and restraint. The Egyptian government for some years had preserved its nuclear option by not ratifying the treaty. Egypt had maintained that the accord did not assure adequate security assistance for nations threatened by nuclear states and that such assurances should include "a pledge by the nuclear powers to consider the threat or use of nuclear weapons to prevent" their use, or failing that, to "retaliate against nuclear aggression as a measure of collective self-defense."[53]

During the visit of President Nixon to Cairo in June 1974, Egypt accepted a US offer to begin negotiations on the sale of 600-megawatt power reactors to both Egypt and Israel. Prior to that time, US policy had been to require inspection only over any nuclear reactors and materials it supplied to a foreign country. As conditions for the sale to Egypt and Israel, however, the United States required that the two recipient states agree to accept international safeguards, as well, over all nuclear facilities and equipment that they may receive in the future from any source.[54]

Egypt expressed a willingness to accept the controls proposed by the United States, and further suggested that both she and Israel also accept international controls over all existing nuclear facilities in both countries. Cairo maintained that since Egypt had no reactor capable of producing plutonium for weapons production, it would be discriminatory to place all of her future facilities under international inspection, while Israel was allowed to operate her uninspected facility at Dimona.

Israel, not surprisingly, demurred at this proposal. The Israeli government all along had had reservations about what Jerusalem perceived to be the pro-Arab leanings of the IAEA. The Israelis

showed little enthusiasm over various provisions in the American draft agreement and delayed a response to the US proposal. A growing belief reportedly arose on the part of Washington that the Israelis preferred that no nuclear power plant be made available to Egypt, especially with the proposed inspection provisions in question, even if this meant that Israel would not immediately receive one from the United States.

In mid-1975, following extensive congressional hearings and intergovernmental negotiations, the United States and Egypt agreed in principle to a nuclear cooperation accord. Under its terms, Egypt would be allowed to purchase two reactors and additional equipment at an estimated cost of $1.2 billion. The reactors would be subject to a trilateral US-IAEA-Egyptian safeguards agreement, reputed to be the most stringent in the world.[55]

Since then, the negotiations have moved slowly. A draft purchase agreement with Egypt was initialed on 5 August 1976, followed a day later by an identical pact with Israel. Until mid-1979, however, no further official US action was taken on the agreements.

Then, in the fall of 1979, the United States resumed active negotiations with Egypt, while the nuclear accord with Israel remained stalemated. This reflected a shift in US policy, inasmuch as past US practice had been to move the agreements with each of the two former adversaries in tandem. According to an administration spokesman, the Egyptian-Israeli peace treaty and Egypt's own initiative in pursuing a nuclear agreement had changed the situation, and the United States was prepared to cooperate in moving the agreement forward. The source added that "so far we've seen no indication from the Israelis that they are ready to move forward."[56] In any case, the US reactors for Egypt would not become operational before the mid-1980s.

While little movement transpired on the US-Egyptian accord since late 1979, President Sadat, during a visit to Western Europe in February 1981, signed a nuclear cooperation protocol with France. The agreement, valued at $2 billion, embraced two 900-megawatt pressurized water reactors, to be built with French technical assistance. Egypt's early 1981 decision to ratify the NPT probably helped to smooth the way for the nuclear accord. The French-built reactors were to become part of a system of eight nuclear power stations planned by Egypt by the end of the century.[57]

With the conclusion of the Egyptian-Israeli peace treaty, any immediate Israeli nuclear threat to Egypt has been effectively removed. Nevertheless, as an Egyptian military strategist has noted: "The peace now is still shaky. Until there is a comprehensive settlement, Israel is still regarded as a threat."[58]

Iraq

Although Iraq has signed and ratified the Nonproliferation Treaty, Baghdad's interest in nuclear research dates back for some years. In the mid-1970s, Soviet assistance made possible the modification and upgrading of Iraq's research reactors.[59] Iraq then negotiated an agreement with France in late 1976 for the purchase of an advanced 70-megawatt Osiris reactor, designed to use highly enriched 93 percent uranium.[60] (Uranium enriched greater than 90 percent is considered weapons-grade.)

The French Foreign Ministry, reacting to US concerns about the reactor agreement, stated in January 1978 that "France intends to keep control of its nuclear export policy." Paris added assurances that the Iraqi agreement conformed to Nuclear Suppliers Group guidelines.[61] French government officials also emphasized that the nuclear reactor agreement was beneficial to the West inasmuch as it loosened Iraqi ties with the Soviet Union.[62]

The specter of Iraqi nuclear power, combined with the presence of Soviet-built *Scud* short-range ballistic missiles (160 nautical mile range) in the Iraqi inventory, provided Iraq with a potential for threatening Israel—something which had hitherto not existed for any Arab state. Consequently, Israel applied intense pressure on Paris (and on Washington) to abrogate the 1976 reactor agreement.[63]

To offset efforts by France, at US urging, to modify the agreement, Baghdad played a skillful diplomatic game of its own. In negotiations with France during the summer of 1979 for oil supplies for the following winter, Baghdad offered increased quantities of oil (600,000 barrels a day) at stable prices in exchange for major new arms purchases and some guarantees on the 1976 reactor contract. Included in the arms agreement were up to 100 *Mirage F-1* and *Delta 2000* fighters, as well as AMX tanks, antitank weapons, and naval craft. As fuel for the reactor, the Iraqis also asked for a guaranteed amount of highly enriched uranium.

The Iraqi program for nuclear development, a few months before, had been seriously set back with the sabotage, in France, of the

Osiris reactor core and other components. In April 1979, only days before scheduled shipment of the equipment to Iraq, an unknown but sophisticated group of saboteurs—widely believed to be Israelis or Israeli symphathizers—entered the French plant at Seyne-sur-Mer and executed the sabotage mission. Although the destruction of the components caused an estimated 2 years' setback to the Iraqi nuclear program, the Iraqis continued negotiations with the French to keep the original reactor agreement and fuel supply contract in force.

After concluding its 1976 nuclear contract with Iraq, France had become more sensitive to proliferation concerns. French officials accordingly had hoped to substitute its low-enriched "caramel" uranium for the highly enriched variety included in the 1976 Iraqi agreement. Tests of the new fuel, enriched to only 6.8 percent, well below the threshold of 20 percent regarded as minimally necessary for even a primitive nuclear explosive device, had been progressing satisfactorily. The French were hopeful that they could persuade the Iraqis to accept this lower grade fuel.[64]

After an unsuccessful 3-year effort to convince the Iraqis, however, the French government in early 1980 agreed to provide weapons-grade uranium enriched to 93 percent for the Iraqi Osiris reactor then under construction in France. One factor in the decision may have been reported Iraqi threats to sever existing contracts for the sale of the $3 billion worth of oil, annually supplied to France, if Paris did not abide by the letter of the 1976 nuclear agreement.[65] US officials, regarding Iraq as the Arab state most likely to develop a nuclear weapon capability in the 1980s, characterized the French decision as "distressing."[66]

"Our general policy for the future is to supply research reactors with low-enriched uranium," according to F. Bryon de l'Eastaing, an official of the French Atomic Energy Commission. But he observed that Iraq is an NPT signatory and has accepted IAEA safeguards on its nuclear facilities. He continued that, "I don't see any legal basis on which this sale can be prohibited for Iraq."

French officials were somewhat vexed over US criticism of their planned sale to Iraq, noting that the United States was the prime supplier of highly enriched uranium for research reactors in various developing countries. France, they averred, has led the way in reducing the enrichment level of uranium fuel used in research reactors.

Nevertheless, whether or not the problem is acknowledged by France, it was clear that several proliferation dangers stemmed from French nuclear cooperation with Iraq. One was the possibility of Iraq's acquisition of highly enriched uranium by diversion or abrogation of the NPT, and second was the use of Osiris to produce plutonium.

Meanwhile, Iraq has not been averse to using its oil supply leverage to obtain additional nuclear technology from Brazil, another of its oil-dependent customers. In the fall of 1979, Brazil signed a "protocol" for nuclear cooperation with Iraq. The accord included Brazilian assistance for uranium exploration and the training of Iraqi technicians in Brazil.[67] Although Brazilian officials denied that they were pressured into nuclear cooperation by Baghdad, Brazil does import about 80 percent of its oil requirements, with Iraq accounting for 40 percent of these imports. Diplomatic sources in Brasilia expressed concern that Iraq would try to use its leverage on Brazil to eventually extract additional nuclear technology which Brazil is acquiring from West Germany under a 1975 agreement for nuclear power plants.[68]

Iraq also has managed to arrange for the acquisition of additional nuclear technology from Italy. In March 1980, it was announced that Italy had agreed to provide Iraq with several nuclear laboratories, including a "hot cell" designed to allow the user to separate radioactive isotopes via remote control. Italy reportedly had assured the United States that Iraq intended to use the hot cells for the manufacture of isotopes for medical and industrial purposes. However, the equipment could also be used to extract small amounts of plutonium from spent nuclear fuel. A Western diplomat expressed concern over Iraq's intentions arising from "the way they (the Iraqis) are going about buying all this equipment. You have to be at least a little suspicious about it."[69]

At the same time, more details on French involvement in the Iraqi nuclear program and the French sale of enriched uranium have appeared in the Western press. The uranium sold to Baghdad apparently has been enriched to 93 percent purity. Although weapons-grade uranium is normally 97 percent pure, 93 percent is considered sufficient for producing a weapon. Electric power reactors normally require uranium enriched to only 3 percent, but the French maintained that the reactors sold to Iraq were for training and experimentation and thus required a much richer mixture.[70]

In the ensuing debate, the French argued that existing international controls would prevent Iraq from using the material for military

purposes. While the French contract was for a reported 75 kilograms of uranium—theoretically sufficient for five or six weapons—the French explained that the reactor used only 15 kilograms of the material and indicated that they would ship only that amount of uranium at a time to preclude any unauthorized diversion of the material. Moreover, the French pointed out that Iraq is a signatory of the NPT and that the nuclear program in that country will be supervised by the IAEA as well as by the 100 or so French technicians present in Iraq.

The French decision to supply enriched uranium to Iraq outraged the Israeli government and precipated renewed discussion on Israeli nuclear policy. The French shipment of uranium, which reportedly began in July 1980, according to press reports from Paris, was particularly disturbing to Israel because the latter regards Iraq as one of its most aggressive enemies. Israeli Prime Minister Begin termed the French uranium deal "a very grave development," while the Foreign Affairs and Defense Committee of the Israeli parliament recommended an Israeli response to what members referred to as "a direct new threat to Israel's security and a fresh source of instability in the region."[71]

In a speech on 17 July 1980, the Israeli deputy defense minister suggested that an Israeli response could include more than diplomatic representations to France and the United States. If such moves fail, he stated, "Israel will have to consider its next steps." Some observers, visualizing a worst-case scenario, raised the possibility of an Israeli air strike to put the Iraqi reactor out of commission. The director general of Prime Minister Begin's office added that "Israel cannot allow itself to sit and wait until the Iraqi atomic bomb falls on our heads."[72]

Israeli officials scoffed at French assurances that international supervision would ensure the peaceful use of Iraqi reactors. Professor Yuval Neeman, one of Israel's most prominent nuclear physicists, was quoted by the *Boston Globe* on 20 July 1980 as maintaining that "the only significance the (Iraq) reactor does have is military. There is no other use to which it or the fuel could be put. The French now have in fact supplied the nuclear explosives for bombs which the Iraqis could build and have ready in less than a year."

Professor Neeman added that Iraq was to receive about 72 kilograms of weapons-grade uranium, sufficient for at least a half-dozen bombs. But he commented that the Iraqis could also use the fissile

material as fuel for their reactor to irradiate natural uranium acquired in Africa and produce plutonium. "All the Iraqis have to do is sit back and decide which sort of bomb they prefer," Neeman concluded. "They can put a bomb together faster with the enriched uranium, but the plutonium will give them more bombs."

The Israelis claimed that France was providing nuclear assistance to Iraq in exchange for a guaranteed supply of oil. They also alluded to French weapons contracts with Iraq for the sale of Mirage aircraft and other military equipment.[73]

In defense of its nuclear contracts with Iraq, France reacted sharply against Israeli and other foreign charges that Paris had acted irresponsibly in its dealings with Iraq. France maintained that the uranium it was shipping to Iraq was strictly limited to the requirements of the research reactors in Baghdad. French sources reportedly stated that if the Iraqis attempted to divert the fissile material it obtains from France, Paris would immediately terminate the deal. This was the first public reference by France to the nature of the restrictions placed on French uranium deliveries to Iraq.[74]

Said a high-level French diplomat: "We absolutely do not want to give the bomb to Iraq. When we deliver a research reactor, we are not delivering a bomb."[75]

US sources reportedly stated that they did not challenge the effectiveness of French controls per se over the reactors or the material supplied for them. What apparently was more worrisome were murkier questions relating to disposal of the spent fuel and the consequences of enhanced Iraqi technical competence, should Iraq obtain additional fissile materials by other means. Moreover, diplomatic sources reportedly indicated that France has not given any official assurances concerning controls to US Government officials nor has France made public the implementing contracts comprising the 1976 nuclear assistance agreement with Iraq.[76]

Iraq reacted to the international furor by brazenly insisting all the more that the agreement be executed as originally constituted. Speaking at a press conference in Baghdad on 20 July 1980, Iraqi President Saddam Hussein observed that a few years previously "Zionist circles in Europe derided the Arabs who, they said, were an uncivilized and backward people, good only for riding camels in the desert. See how today these same circles say without batting an eyelid that Iraq is on the point of producing an atomic bomb."[77]

In September 1980, war broke out between Iraq and Iran over a long-simmering border problem and other strategic and political issues. Iraqi ground forces invaded the Khuzistan oil-producing province of Iran and both sides launched air attacks against some of each other's strategic installations. On 30 September, an air raid, presumably conducted by Iranian aircraft but of still somewhat uncertain origin, was conducted against the Iraqi nuclear center of Tuwaitha about 10 miles from downtown Baghdad. Several bombs reportedly damaged an auxiliary building and forced the evacuation of French technicians assigned to the facility, but did not damage the reactors nor the nuclear fuel supply.[78]

The attack on Tuwaitha raised the immediate question of who conducted the raid. Although Iran appeared to be the plausible party, some speculation alluded to the involvement of Israel, for obvious reasons. Israel denied any involvement, but, interestingly enough, the Israeli chief of military intelligence appeared on Israeli television two days before the attack, wondering why the Iranians had not bombed the Iraqi nuclear installation. Iranian President Abol Hassan Bani Sadr subsequently admitted that the attackers were Iranian, but he stated the attack was intended for another target nearby.[79]

Following the raid, France temporarily suspended shipment of additional nuclear fuel and withdrew most of its technicians from the country because of war danger. Only a handful of French workers remained at the site to assist in maintenance and security duties. The program, with its planned startup of both reactors in 1981, may have been delayed for a year or so.[80]

The withdrawal of French technicians led to another troubling consequence—the unknown disposition of the enriched uranium already delivered to the Iraqis. Indeed, the involvement of Iraq in hostilities gave rise to more general uncertainties over the effectiveness of international safeguards over fissile material in a war zone. This fear became a reality on 6 November 1980 when Iraq informed the IAEA that the latter's periodic safeguards inspections would be "unsafe" during the current war period and must be "temporarily" halted. The Iraqis indicated that IAEA inspections would be permitted again "as soon as prevailing conditions have ended and the security of inspectors can be guaranteed." An IAEA spokesman reported that Iraq had hitherto complied with all its nonproliferation obligations and that there were "no big safeguards concerns," but added that "if the war goes on a year, then it will be serious."[81]

IAEA inspectors visited the Iraqi reactors in the late summer of 1980, after France delivered its first consignment of enriched uranium, but just prior to the outbreak of the Iran-Iraq war. The amount of fuel delivered to Iraq was below the threshold regarded by IAEA as "of safeguards significance," and the fuel apparently was in storage and not yet irradiated, both pluses from the safeguards perspective, according to an IAEA official. The official continued that he saw "no big safeguards concern" at present, but added that the situation "could be quite different" if large amounts of fissile material were involved or if inspections were separated by unusually long periods.

In February 1981, however, the IAEA cryptically announced that a "routine inspection" of the Osiris reactor in January indicated that all of the nuclear fuel had been "satisfactorily accounted for." At the same time, this announcement contradicted widespread reports, particularly in France, that some of the reactor's fuel rods had disappeared.[82]

French officials in any case have indicated embarrassment at the uncertainty surrounding the reactors in the wartime situation. They have admitted that such a situation places the entire problem of proliferation in a new light and that the problem should be carefully considered by the international community. A French source commented: "We are in a completely new situation that was not foreseen in any international treaties. The problem is raised for international reflection just as sharply as it was in 1974 when India made its explosion." Thought must now be given, he said, to finding safeguards against diversion of materials from nuclear facilities in war zones.[83]

On 7 June 1981, a watershed event occurred in the Middle East when Israeli aircraft, in a surgically precise operation, attacked and destroyed the French-built Osirak reactor at the nuclear research center at Tuwaitha on the outskirts of Baghdad. Eight Israeli F-16 fighter bombers, each carrying two 2,000-pound bombs, with six F-15 fighters flying escort cover, penetrated Iraqi airspace at low altitude and bombed the reactor in a surprise attack.[84]

Each of the F-16s reportedly made one pass, dropping a total of 16 tons of high explosives on the reactor. According to a French technician in the vicinity of the attack, "the precision of the bombing was stupefying." The Israelis said they used regular iron bombs, but Pentagon experts studying photos of the raid commented that the accuracy of the bombing suggested the use of precision-guided "smart bombs." In any case, the bombs apparently penetrated and

cracked the dome of the 70-megawatt reactor like an eggshell, blasting it off its foundation and damaging two other buildings in the complex.[85] French technicians at the scene confirmed that the facility was "completely destroyed" and estimated that it would take 3 years to rebuild.[86]

The Israeli government, which announced the raid on 8 June, claimed that the action was taken to prevent the development of nuclear weapons which were intended for use against Israel. A statement issued by Prime Minister Begin's office on that date stated that the reactor posed a threat to Israel's security and that it would have been completed by July or September 1981. The statement continued that "reliable sources have no doubt, and we have learned, that it is intended, despite the camouflage, to create atomic bombs. The target of those bombs was Israel."[87]

At a 16 June press conference, Begin presented a humanitarian twist to the raid. He stated that the reactor was scheduled to go "hot" and begin processing highly radioactive materials either in July or September. Once that happened, Begin claimed, any successful bombing attack would have unleashed "a horrifying wave of radioactivity" in which "hundreds of thousands of innocent citizens would have been hurt." Begin continued that he "would never have made a proposal under such circumstances to send our air force and bomb the reactor."[88]

On the other hand, French technicians in Baghdad were quoted in press accounts as stating that the reactor was scheduled to begin operating only at the end of the year. Israeli opposition Labor Party leader, Shimon Peres, also questioned whether the date of the attack might have been dictated by the Israeli elections, scheduled for 30 June 1981, in which Begin was narrowly reelected.[89]

Concerned over the potentially serious consequences of the Israeli raid on regional stability, the United States on 8 June strongly condemned the attack which involved the use of American-made aircraft. A US Department of State spokesman said the United States would investigate whether Israel had violated US laws governing the use of American-built weapons sold abroad. In the meantime, the United States temporarily suspended the delivery of additional aircraft to Israel.[90]

Although Washington had formerly protested the construction of the French-built reactor in Baghdad, the State Department spokes-

man maintained that the United States did not share Israel's sense of immediate threat. He observed that Iraq was a signatory to the nuclear nonproliferation treaty and had agreed to international safeguards. "We have no evidence that Iraq has violated its commitments under the treaty," the spokesman said, but added that the United States remained concerned that the Iraqi nuclear program could "pose a threat at some point in the future."[91]

Along with numerous other governments, the recently elected Mitterrand government in France also condemned the Israeli attack. Premier Pierre Mauroy called the raid an "unacceptable and very grave act . . . that would complicate a situation that was already quite explosive." The French government, however, stopped short of cancelling President Mitterrand's prospective trip to Israel, the first by a French president.

Iraq and other Arab countries bitterly denounced the Israeli attack. Baghdad accused Israel of colluding with Iraq's military opponent, Iran, claiming that "the Zionist enemy has on more than one occasion taken the side of Iran against Iraq." Iraq, however, did not threaten retaliation, largely, US officials believed, because its military was bogged down in the war with Iran.

Israel's rationale for the raid was the strategic contention that Israel, unlike the United States, could not survive a nuclear attack and deliver a counterstrike. All Israeli airbases, for example, could be taken out in a single strike. The country accordingly regarded itself as particularly vulnerable to nuclear blackmail. The Begin administration position was that no Israeli government could ever accept the risk that an enemy possessing nuclear weapons would not use them.[92]

By invoking an argument sometimes referred to by legal scholars as "anticipatory self-defense," the Israelis were entering a murky area of international law. The United Nations Charter, while prohibiting aggression, also recognized the legitimate right of self-defense, which has been broadened on occasion to include preemptive attack in the face of overwhelming evidence of an imminent hostile act by a would-be agressor. In the words of international law professor Christian Tomuschat of the University of Bonn, "It always comes down to the same question: Was there a real and imminent danger that would have justified a preventive strike?"[93]

So much then centered on the critical questions: was the Iraqi nuclear program capable now, or in the near future, of producing a bomb and did the Iraqis intend to do so? On these points experts differ and the evidence is mixed.

As stated above, the quickest and easiest route to atomic bomb manufacture is through the use of enriched uranium. In this connection, Professor Yuval Neeman, a physicist and member of the Israeli Atomic Energy Commission, stated in an interview on 16 June 1981 that Iraq would have been able to produce sufficient enriched uranium for two Hiroshima-type bombs immediately after its Osirak reactor became operational in September.[94]

The French, however, reportedly had taken two precautions to prevent such diversion of uranium. First, they had decided to stagger shipments of uranium, sending 12 kilograms at a time to Iraq, to prevent stockpiling for weapons use. Once processed through the reactor, each shipment would no longer be suitable for military use and would then have to be returned to France before the next was released. Moreover, the French contend that an Iraqi diversion of the material would have been discovered by one of the 150 French technical advisers working at the facility. The second precaution was preirradiation of the uranium, making it hazardous to handle.[95]

Israel first of all questioned whether France would have adhered to the staggered delivery arrangement. With regard to irradiation of the uranium, Iraqi handling may have been made possible through use of a "hot cell," a lead-shielded laboratory designed to handle radioactive substances, which was purchased earlier from Italy.[96]

The second major route to bomb acquisition, through the use of plutonium, would have been somewhat more complicated. The Osirak reactor was not suited for large-scale production of such material. According to Israeli Professor Neeman, however, Osirak could have been modified in about 6 weeks by irradiating a surrounding "blanket" of low-grade uranium of the type Iraq had been stockpiling. The plutonium produced through this process could then be separated from the irradiated fuel in the Italian-built "hot cell" laboratory. This procedure could theoretically produce sufficient plutonium for the manufacture of one to three bombs a year, according to Professor Neeman.[97]

A report by IAEA Director General Dr. Sigvard Eklund, issued after the raid in June, claimed "a very high probability" existed that the

diversion of any enriched uranium fuel or the production of plutonium would have been detected by IAEA inspectors or French technicians present at the facility. Dr. Eklund reported that his agency had last inspected the reactor the previous January and had accounted for the first shipment of fuel in its entirety. Had the Iraqis decided to divert the uranium, they would have had to remove it from French supervision and abrogate their treaty commitments. No signatory of the NPT treaty had yet abrogated the safeguards.[98]

Professor Neeman acknowledged that any inspection team would have observed changes in the Iraqi reactor. "But, what could they have done?" he asked.[99] Israel strongly contends that Iraq had been using NPT membership as camouflage while it amassed the necessary ingredients for a weapons capability. When that goal was achieved, the Israelis contend, Iraq would have abrogated its treaty commitments and produced a weapon. Rather than supported by substantive evidence, however, these arguments hinge largely on an assessment of Iraqi intentions and circumstantial evidence, namely Iraq's purported need for a large nuclear reactor in the face of its substantial oil resources, an apparent inconsistency between Iraqi nuclear research plans and the lack of a power program, the stockpiling of uranium ore from Portugal and Niger without any means of refining it, Baghdad's interest in plutonium reprocessing technology, and its rejection of French-offered low-enriched uranium suitable for a reactor, but not for a weapons program.[100]

Testifying before the House Foreign Affairs Committee on 8 June 1981, Under Secretary of State Walter J. Stoessel, Jr., stated that the US intelligence community had not concluded that Iraq was planning to build a weapon. Another State Department official commented that "while many in the intelligence community believe that Iraq was seeking a nuclear weapon capability, there was never a formal determination that this, in fact, was the case."[101]

The divining of Iraq's intentions is, of course, an individualistic and arbitrary endeavor. Israel insists that it reserves the right to make such a determination by itself. "If the nay-sayers were correct," an Israeli diplomat commented, "if Iraq was not going to develop a bomb to use against us, then a mistake was made .... But if we were right about their intentions but failed to act, the error in assessment would be catastrophic for Israel. That risk was too great."[102]

As the verbal fallout continued after the Israeli raid, Iraqi President Saddam Hussein in a 23 June speech called on "all peace-

loving nations of the world" to assist the Arabs in acquiring atomic weapons to balance what he described as Israel's nuclear capability. The Iraqi president declared:

> Regardless of Iraq's intentions and capabilities at present and in the future, any country in the world which seeks peace and security ... should assist the Arabs in one way or another to obtain the nuclear bomb in order to confront Israel's existing bombs. This will realize and achieve peace regardless of the Arab's aims and capabilities.[103]

Ridiculing Israel's rationale for the raid, the Iraqi president stated that the Israelis in the future might even "interfere with roads ... in Saudi Arabia and ask that their direction be changed under the pretext that they pose a threat" to Israel. He also averred that Israel might "ask Arabs to cancel the study of chemistry, physics, mathematics, and astronomy in the curricula of their colleges and high schools because they might give the Arabs knowledge in the military sphere, thus threatening Israel's security."[104]

Israeli officials, who were earlier embarrassed over a misquote by Begin regarding Iraq's nuclear intentions, cited Hussein's speech as proof of their contention that the Iraqis were seeking to produce a nuclear weapon for use against Israel. An Israel spokesman asserted that Saddam has "simply admitted that what we suspected was true. If you are looking for evidence, this is it."[105]

Despite Israeli threats to bomb the reactor again if any attempt is made to rebuild it. Iraqi President Hussein reaffirmed plans to do so, saying that "the people who had built the reactor are able to build more than one reactor for the sake of freedom." Saudi Arabia offered to finance reconstruction of the facility, which had been built at an original cost of approximately $250 million.[106]

President Mitterrand expressed French readiness in principle to rebuild the facility after 2 days of talks in Paris in mid-August 1981 with Iraqi Vice-Premier Tarek Aziz. This French president reportedly took the position that no grounds existed on which France could refuse to provide Iraq with equipment or technology available to other countries, according to French officials. At the same time, a new contract to reconstruct the nuclear center apparently was contingent on the inclusion of strengthened new safeguards.[107] President Mitterrand had stated on 17 June 1981 that France would consider reconstruction of the facility only if Iraq would first agree to the same

safeguards against military use that Paris would apply to all future nuclear technology sales.[109] This position was subsequently reiterated by French Foreign Minister Claude Cheysson who also met with Aziz in August.[109] It remains to be seen whether a change in the French position will emerge.

Libya

In the most pessimistic predictions concerning nuclear proliferation in unstable Third World countries, Libya is commonly pointed to as a worst-case example. The erratic, unpredictable temperament of the Libyan leader, Colonel Muhammed el Qadhafi, is sufficiently "maniacal" to pursue his oft-expressed dreams of furthering Islamic unity and Libyan national goals by the use of atomic weapons, if they could be obtained.[110]

One of the initial indications of Qadhafi's interest in nuclear weaponry was an April 1975 newspaper interview, which reflected his hopes of transforming Libya into a nuclear power. "Nuclear weapons are no longer a secret," he stated.[111]

The following month, Libya ratified the NPT treaty. Then, in an action typically reflective of Qadhafi's erratic nature, Libya in June 1975 signed an agreement with the Soviet Union for a two-megawatt research reactor, which could be upgraded to 10 megawatts. US specialists expressed only mild concern at the time, characterizing the reactor—which is now in operation outside of Tripoli—as too small to produce weapon-size quantities of plutonium.

Of more acute concern to Western officials was a preliminary agreement with France in March 1976 for a 600-megawatt nuclear power plant. After further contemplation, however, France subsequently withdrew from the deal.

The Soviet Union in December 1977 reportedly concluded another contract with Libya for construction of a 300-megawatt reactor and a nuclear research center. It is problematic whether the Soviets will provide the reactor. Under normal Soviet practice, this would be strictly safeguarded to prevent its production of weapons-grade material.[112]

In the meantime, since Libya is regarded by some nuclear experts as at least 7 or 8 years away from establishing even the nucleus of a research establishment,[113] Qadhafi has been continuing his

efforts to purchase an atomic weapon from any interested party. As early as 1970 Qadhafi reportedly had asked to actually purchase such a weapon from the People's Republic of China, but the Chinese politely rejected the offer.[114]

Speculation also is rife that Libya has provided financing for Pakistan's nuclear development program, with the intention of eventually obtaining an "Islamic nuclear bomb" from Pakistan (see later section on Pakistan). Both countries have officially denied all such allegations. At the same time, it was reported in late 1979 that Niger had sold quantities of 70-percent pure uranium ore, called "yellowcake," to both Libya and Pakistan. While differing figures on the quantity of uranium ore sold by Niger to both countries have appeared in different sources, it is evident that some quantities have been sold. While claiming to be adhering to IAEA requirements in making the sales, Niger reportedly has sold uranium to Libya as part of a tacit 1974 agreement with Qadhafi not to make any territorial incursions on the adjoining state.[115]

In January 1980, the French Atomic Energy Commission denied press reports that France was involved in the sale of uranium mined in Niger—the world's fourth largest producer—to Libya and Pakistan or that shipments of the ore had been stolen. The director of the commission confirmed that uranium from two mining companies, in which the French government is a minority shareholder, had been sold to Libya and Pakistan, but that the sales were made by the Niger government from Niger's share of production. He maintained that the sale of 258 tons of yellowcake to Libya and 110 tons to Pakistan over the past three years was in conformity with IAEA regulations.[116]

More recently, Niger's President, Colonel Seyni Kountche, stated that his country had sold 450 tons of uranium ore to Libya and may sell more. Kountche was quoted as saying that Niger needs money so badly that "if the devil asks me to sell him uranium today, I will sell it to him."[117]

Libya's small research reactor, experts maintain, would be incapable of using all of the uranium ore in question. It is possible that at least some of the ore purchased by Libya has been transferred to Pakistan,[118] but there is no available evidence to support this possibility.

Like Iraq in its recent nuclear cooperation accord with Brazil, Libya reportedly has used its oil supplies to put pressure on India for

increased cooperation in the atomic field. Unlike the Iraqi-Brazilian accord, however, there is no indication that Libyan pressure has been successful. At the same time, the Indians undoubtedly would be relieved to see any semblance of Libyan-Pakistani nuclear cooperation dissipate and future discreet Indian-Libyan technical cooperation should not be ruled out.[119]

An Indian-Libyan agreement, signed in 1978, and similar to accords signed by New Delhi with other Third World states, had provided for limited Indian nuclear training of Libyan technicians. Libya recently pressured India to increase the level and sophistication of nuclear technical assistance, but India refused. As a result, Libya abruptly suspended contracts for about 1 million tons of crude oil to India. New Delhi responded by stating that India would not agree to any linkage between oil supplies and nuclear technical assistance and promptly recalled its ambassador for consultations.[120]

Prospects for Arab Nuclear Cooperation

Given the dearth of trained scientific and skilled manpower and technical infrastructure in each of the Arab states, some type of multinational Arab cooperation in nuclear development would appear potentially attractive. However, a number of factors militate against such a possible combined effort. First is the instability of inter-Arab relations. Although some Arab states have periodically cooperated in opposing Israel, this cooperation has normally been of short duration and limited effectiveness. Despite an unusual degree of inter-Arab cooperation during and shortly following the 1973 war, the two Sinai disengagement agreements not surprisingly served to split the moderate and radical camps by 1975. By 1976, even fellow members of the rejectionist coalition—Syria, Iraq, and the PLO—were quarreling among themselves.[121]

Another constraint is the limited promise of immediate return from a combined effort. The problem, as alluded to previously, is not only a dearth of industry or trained manpower, but a nearly-complete absence of technical infrastructure, research facilities, or substantial experience with nuclear technology. Some progress is being made toward the development of such an infrastructure in several Arab countries, and a combined group of countries might hope to usefully pool resources and perhaps progress more quickly than an individual state. At the present starting point, however, one may question the efficacy of combining these individual modest competencies.

Another hindrance is the cost of a combined venture. European experience with the Multi-Role Combat Aircraft and F-16 joint production indicates how multinational programs can increase costs. Unless the Arab regimes increase their degree of mutual trust, moreover, any nuclear facilities would be unlikely to be concentrated in one country. Both the UK and France, for example, have insisted on assembling Concorde SSTs at substantial cost. Similarly, dispersing facilities among a number of Arab states would mean either costly duplication (reducing the advantages of a combined program) or mutual dependence that would be obviously vulnerable to denials or pressuring. Such prospective problems notwithstanding, some type of cooperative endeavor could provide several advantages.

The most obvious Arab asset is the availability of capital. The oil-producing Arab states in the past have provided substantial amounts of financial support to their economically hard-pressed, but more militarily-capable, neighbors, particularly Egypt, Jordan, and Syria. The availability of cash on the part of the oil producers has similarly drawn skilled manpower to those states. One of the most highly educated Arab groups, the Palestinians, for example, fill many of the skilled technical jobs in the Gulf states. Also, desite the ebb and flow of Egyptian-Libyan relations, large numbers of Egyptian technicians continue to hold jobs in the Libyan economy.

Another manifestation of inter-Arab cooperation has been the existence until recently of the Arab Organization for Industrialization (AOI), combining Egyptian manpower and factories and cash from Saudi Arabia, Qatar, and the United Arab Emirates. In existence from 1975 until 1979—its dissolution resulting from political fallout from the Egyptian-Israeli peace process—the AOI was more successful in the planning than in the production phase. Nevertheless, contracts had been signed and preparations were under way for joint European-Arab production of anti-tank missiles, helicopters, and other equipment, to eventually include fighter aircraft.

Such industrial cooperation might be extended to embrace nuclear activities including research, fuel rod fabrication, spent fuel storage, or fuel enrichment or reprocessing. It may be that no cooperative endeavor would result in the production of nuclear weapons per se, only in producing nuclear explosive materials, with the final stages of weapons development and fabrication left in the hands of individual states.

Another variation of an Arab nuclear development program could involve the joint training of scientists and technicians in an

Arab or other country. In addition, foreign supplier assistance might make available fissionable material, reactor fuel, or other materials or equipment, with the French Osiris-type reactor supplied to Iraq, discussed earlier, as a case in point.

It is likely that any future equipment or materials provided by supplier states to the Arabs would be under safeguards to prevent or dissuade use of the material in nuclear explosives. What price a country might be willing to pay in violating a safeguards agreement would depend on such factors as urgency of security requirements at the time, likely sanctions to be faced, and the time required to construct and deploy a weapon. In addressing possible sanctions, any likelihood of their use against an Arab state would have to be considered in light of the possibility of the Arab states' use of oil supply sanctions of their own.

IRAN

In the decade of the seventies, Iran was frequently referred to as an example of a state motivated to become a nuclear weapons power for reasons of prestige. Supporting this observation were the Shah's grandiose programs for rapid modernization, economic development, and investment in Iran's military forces and by the acceptance in the West of Iran as the dominant Persian Gulf power. While the fundamentalist and reactionary forces that overthrew the Shah's regime have vehemently repudiated the Shah's programs, it is by no means clear that Iranian foreign policy will always run counter to the proclivities of the Shah. In fact, what motivations might have attracted the Shah in terms of potential grandeur could also appeal to his successors as an avenue toward independence from the East and West.[122]

For the duration, however, Iran appears to have relinquished its search for an extensive nuclear power development scheme. In early 1980, the new Iranian government halted the deposed Shah's program of nuclear power,[123] reportedly entailing a planned generating capacity of 34,000 megawatts in some 15 reactors by 1995, at a cost conservatively estimated at $12 billion.[124]

Under the bureaucratic momentum generated by the Shah, Iran had developed a number of potential politico-military interests. Given Iran's grandly enhanced conventional force posture, developed under the Shah's personal tutelage, many of Iran's policy goals can still

be pursued without nuclear weapons. Iran would seem to have more to lose—by stirring up regional rivals and making its Soviet neighbor nervous—than to gain, should it introduce nuclear weapons.

At the same time, should Teheran feel that a nuclear deterrent would be useful against the Soviet Union or another regional power, the nuclear option could gain attractiveness. The attitude of the present regime is problematic, but the repudiation of Iran's formerly close ties with the United States automatically eliminates those defensive options backed by US military force. A reactionary regime lacking allies may be instinctively antinuclear.[125] Nevertheless, the vagaries of Persion Gulf politics and regional developments make the future course of Iranian policy vis-a-vis the nuclear option uncertain.

PAKISTAN AND THE "ISLAMIC BOMB"

Pakistan serves as the most likely source of nuclear-related technical assistance to the Arab states because of the existing network of political, religious, and military ties between Islamabad and some of the Arab capitals. The Pakistanis have been providing military training to Arab armed forces for some years. Some Pakistani technical specialists had reportedly participated in Iran's nuclear program until the latter effectively came to a halt after the demise of the Shah. It is possible that Pakistan could similarly assist an Arab nuclear program, given the required combination of political and economic conditions.[126]

Pakistan's interest in acquiring a nuclear reprocessing facility of its own is well known. After lengthy and involved discussions between France and Pakistan, accompanied by considerable diplomatic pressure by the United States, the French government, in mid-1978, terminated the reprocessing plant contract between Pakistan and the French firm, St. Gobain Techniques Nouvelles (SGN). By that time, Pakistan had received most of the plant's blueprints, but little of its sensitive equipment.[127] Pakistani efforts to acquire nuclear technology nevertheless continued both overtly and covertly.

Under the prior agreement with France, the Pakistan reprocessing plant would have been subject to safeguards, but a loophole existed in the latter. Islamabad was free to transfer plutonium or reprocessing technology to any party it wished, as long as the subject materials or technology were placed under safeguards. Conse-

quently, no legal barrier existed to prevent Pakistan from shipping "safeguarded" plutonium to an Arab state, even if one of the latter had begun an overt nuclear weapons program. Such a problem might then be viewed as applying to the Arabs, the IAEA, or the U.N. Security Council, but not to Pakistan.

As for economic inducements, Arab blandishments of hard cash—particularly from the would-be nuclear states of Libya and Iraq—to impoverished Pakistan could prove too tempting for Islamabad to resist. Indeed, indications of Arab funding offers appeared immediately after initial French efforts to delay the Pakistani nuclear agreement by holding up guarantees of export credits.

This support was reported to have followed warnings by Pakistani President Ali Bhutto to the Arab world of the threat posed to it by an Israeli nuclear capability. Bhutto was accordingly quoted as follows:

> We know that Israel and South Africa have full nuclear capability. The Christian, Jewish, and Hindu civilizations have this capability. The Communist powers also possess it. Only the Islamic civilization was without it, but that position was about to change.[128]

After India exploded its nuclear device in 1974, Pakistan successfully prevailed upon the United States to lift its embargo against the subcontinent. Just before the embargo was lifted, Bhutto stated that "Pakistan has no intention at this point of developing nuclear weapons, but the country may be forced into a military nuclear program if its back is to the wall."[129] The Pakistani president added that the country's nuclear policy remained under review, with much depending on whether the United States provided Pakistan with sufficient conventional arms.

Many observers believe that Pakistan is most likely to become the first Muslim country to acquire an atomic weapons capability. Besides somewhat offsetting the Indian military threat, such a development would enormously augment the prestige and influence of Pakistan in the Islamic world, as well as undermine the conventional military capability of other neighbors, such as Iran. Such considerations undoubtedly serve to make the nuclear option perhaps overpoweringly attactive to Islamabad.

As is the case with India, Pakistan has not signed the NPT treaty. Unlike India, however, Pakistan has offered to place its nuclear

facilities under IAEA safeguards and has made some overtures for nuclear arms restraint in the area. While reflecting serious concern over the Indian nuclear capability, Pakistan has denied any intention of developing nuclear weapons of its own. In response to the Indian nuclear test of 1974, Islamabad adopted a strategy designed to augment its own military power relative to the increasing military potential of India. It sought security guarantees from the great powers, attempted to bolster its conventional forces, tried to diplomatically neutralize India's nuclear capability,[130] and embarked on a nuclear program of its own.

The modest Pakistani research program was upgraded after the 1974 Indian nuclear test. A 1975 IAEA study reported Pakistan's critical need for additional energy and the likelihood of increasing future reliance on nuclear power. From possession of one small nuclear reactor in 1976, Pakistani plans were to build 24 medium-sized power plants by the year 2000.

In 1976, Pakistan contracted with France for a reprocessing plant which was to have been covered by IAEA safeguards. Pakistan had agreed to the safeguards despite the assertion of Pakistan's UN ambassador that his country "does not seek a nuclear arms race in South Asia, for such a race would not add to the security of the countries concerned...." The ambassador went on to state that his country had accepted international safeguards, but warned that "Pakistan is not incapable of fabricating a fuel reprocessing plant." This uncommon mixture of frankness and ambiguity underscored Pakistan's dilemma in its perceived position of inferiority in the shadow of its nuclear-capable neighbor.[131]

In the summer of 1978, a British Labor Party Member of Parliament raised a question in the House of Commons concerning the alleged Pakistani purchase of specialized electrical equipment called "inverters," which could be used in the operation of a gas centrifuge system for the enrichment of uranium. This question resulted in an elaborate investigation by US and other foreign intelligence agencies, which reportedly concluded that the Pakistanis were surreptitiously and systematically purchasing components for construction of a centrifuge uranium enrichment plant. This startling development apparently caught the nuclear supplier states by surprise. Although France had earlier cancelled its contract for a reprocessing plant for Islamabad, it appeared as if the Pakistanis, by late-1978, were fairly far along in assembling equipment for a centrifuge facility.[132] The

United States in April 1979 thereupon suspended all military and economic assistance to Pakistan under terms of a 1976 law intended to curtail proliferation.[133]

The concerns of the nuclear states over Pakistan's progress in nuclear development are summarized by one close observer:

> The commotion over the sale of the French reprocessing plant has dramatized the nervousness of countries that in previous years, when Pakistan drew attention to potential sources of conflict on the subcontinent, remained largely unmoved. It has also shaken up the accepted principle of Indian superiority over Pakistan.... Moreover, it signifies that the big powers are alert only to the nuclear threat ... and have somehow come to accept the occurrence of conventional wars. ... The use of nuclear "devices," on the other hand, is totally unacceptable.... To hold this weapon, then, is automatically to involve the major powers in the problems that may lead to its use.[134]

Behind the disclosure in Parliament was the finding by British authorities that Islamabad had purchased 30 such high-speed inverters in 1977 through a West German contractor and was attempting to buy 100 more. The ostensible destination was a textile mill in Pakistan. British authorities intervened upon the determination that the inverters were not of the type suitable for use in textiles, but rather of the kind used in British nuclear installations. The latter type were capable of high-speed operation necessary to separate the fissionable isotope, U-235, from ordinary uranium. Thousands of these units are linked to comprise "cascades" used to produce weapons-grade uranium. In September 1978, the British government ordered the involved company, Emerson Electric, to halt production of the second order of inverters and terminate the sale, and the company thereupon complied.[135]

Further investigation by US, British, West German, and Dutch intelligence agencies apparently discovered that the Pakistanis had been shopping for essential equipment for some time, often using "front" organizations as purchasing agents. Further disclosures turned up at an early 1979 IAEA conference in Vienna when a Dutch engineer revealed a large Pakistani order for "martensitic aging steel," a special hardened alloy designed for jet engines as well as gas centrifuges. Inasmuch as Pakistan had no capability for jet engine production, the orders for steel alloy, together with the inverters for speeding centrifuge processes, were clear indicators of a Pak-

istani uranium enrichment operation, reportedly located in the town of Kahuta, 25 miles south of Islamabad. US officials reportedly acknowledge that Pakistan had eluded the elaborate controls of the IAEA, as well as those of the London Nuclear Supplier Group, in progressing as far as it had in its nuclear development program.

The efforts and pressure of the United States and other nuclear supplier nations notwithstanding, the Pakistanis continued to procure nuclear related technology where they could. In September 1980, reports in the *Washington Post* revealed that the United States had applied pressure on Switzerland in an attempt to block sales to Pakistan of gas centrifuge components for use in producing enriched uranium. The Swiss government maintained that the precision equipment was not on any list of prohibited nuclear exports and thus the transaction had violated no international agreements. US officials nevertheless were reported to believe that Switzerland had violated the spirit, if not necessarily the letter, of the NPT, as well as the Nuclear Supplier Group agreement restricting the transfer of sensitive technology with potential nuclear weapon application.[136]

Also in 1980, Pakistan was reported to have received some US-made sensitive electronics equipment with nuclear application, illegally shipped via Canada. The pieces of equipment involved were identified officially as "condensers and resistors," but reportedly were components of inverters similar to the equipment brought to light in the 1978 British parliamentary discussions. Three Canadian citizens were arrested by Canadian police and charged with violating export laws in connection with the case. Disclosure of the incident was particularly embarrassing to the Canadian government inasmuch as a Canadian-built nuclear reactor in India was used in the production of the nuclear device detonated in that country in 1974.[137]

Pakistan then appears to be facing three choices in its nuclear development: (1) adhering to a strictly nonmilitary use of the atom, (2) developing the capability for producing nuclear weapons, but refraining from so doing, or (3) embarking on a crash project to produce a weapon. The Pakistanis appear to be exhibiting signs of both options 2 and 3, combining an ambitious nuclear power program with the acquisition of facilities for a complete fuel cycle, which will enable them to produce the plutonium essential to a nuclear test. The direction and intensity of the Pakistani nuclear program will depend on several factors, including the nature and pace of India's nuclear program and the perceived threat emanating from New Delhi, and overall security developments in the region.[138]

Given Pakistan's poor economic position, the question of financing an expensive nuclear program remains critical. The cost of a modern gas centrifuge facility of the type in question may run as high as $500 million.[139] While not beyond Pakistani capabilities, such a price tag would strain Pakistan's economy to a substantial degree, raising the possibility of the Pakistani sale of enriched uranium or of the sharing of its nuclear technology with foreign buyers to capitalize on its investment.

Direct financial assistance to Pakistan from Arab donors, practically nonexistent before 1973, already has grown to substantial proportions in recent years. From 1974-1976, for example, five Arab countries provided Pakistan with approximately $1 billion in credits and loans, or nearly one-third of total foreign financial assistance received by Islamabad in the period, indicating the degree of Pakistani economic reliance on Arab largesse. Along with Egypt (prior to 1978) and Syria, Pakistan had become one of the largest recipients of assistance from the OPEC countries, most of which has been on favorable financial terms.[140]

Besides general purpose aid agreements, a number of Arab countries have committed themselves to investment in a variety of joint industrial projects in Pakistan. Moreover, the Arab states currently absorb more than a quarter of Pakistani agricultural and industrial exports. Remittances from Pakistanis working in Arab states by 1978 exceeded $1 billion, an amount approximately twice as large as Islamabad's annual foreign debt servicing payments. In addition, Pakistan's Arab benefactors provide an assured source of oil.

At the same time, the economic benefits to Pakistan from its Arab ties are not one sided. By 1977, more than 300,000 Pakistanis were providing needed labor services in the Middle East. About two-thirds were unskilled laborers, engaged in construction activities, while the remainder provided badly needed skilled and professional services, including medical, managerial, and accounting skills. In addition, Pakistan maintains highly capable military advisory and training contingents in a number of Arab countries and offers training programs in Pakistan.

While indications of Arab financial support for the Pakistani nuclear program remain unsubstantiated,[141] Libya, Iraq, and the United Arab Emirates[142] are reported to have offered lavish aid to induce Islamabad to share its nuclear technology and produce an "Islamic bomb." One of Libyan President Qadhafi's principal aides, Major Abdul Jalloud, was reported to have visited Pakistan in October 1978 to expressly renew Libyan offers of financial assistance for Pakistan's nuclear program.[143]

Pakistan has continued to deny any intention of building nuclear weapons, or of any Arab financing of a uranium enrichment facility. Islamabad admits that research on uranium enrichment is under way, but insists that such material is intended only for nuclear power reactor fuel.[144]

Pakistani President General Zia ul-Haq in a September 1979 interview stated that "Pakistan is not in a position to make a bomb and has no intention of making a bomb." General Zia confirmed reports that his country had launched a program to produce enriched uranium, but insisted that the material would not be weapons grade and was intended as an urgently needed source of energy. "If we do not get an alternative source of energy, Pakistan will choke in the next few years," he said.

Discussing Pakistan's nuclear program, the general said: "It is a model, modest, a miniature program for enriching uranium. ... We need enriched uranium to run the lightweight reactors of modern technology." He averred that Pakistan was "nowhere near" acquiring the technology that would involve taking "the little bit of enriched uranium to run a plant, convert it into weapons grade, then into metal, making a device, a trigger mechanism, a delivery system, and then exploding it."[145]

Pakistan's public denials of a nuclear weapons program were given no credence by Western officials. Photographs of the closely guarded uranium enrichment plant construction site at Kahuta reportedly leave no doubt as to the purpose of the facility.[146]

An even more ominous facility development occurred in September 1980 with the first press reports that Pakistan was clandestinely building a small plutonium reprocessing plant near Rawalpindi. Western specialists reportedly credited the small facility with the capability of processing enough fissile material for the Pakistanis to stage a nuclear test perhaps before the end of 1982. In contrast, it was believed that the larger enrichment plant under construction at Kahuta would not be producing weapons grade uranium before 1983 at the earliest, and more likely not until 1985.[147]

Western specialists had believed that work on the small reprocessing facility was abandoned several years ago, when the Pakistanis contracted for the French reprocessing plant which was

10 times as large. When the French abrogated their contract for the plant, however, work apparently was clandestinely resumed on the original facility. Press sources reported that by the time the United States learned of the facility and informed European governments of it, the Pakistanis had already acquired the critical equipment necessary to build it from various French firms. Experts believed the plant was designed to produce 22 to 44 pounds of plutonium annually, enough for "one or two—at the most three" nuclear weapons a year. A knowledgeable source commented that "for Pakistan to have obtained a bomb's worth of plutonium from this facility within a year is probably a worst-case scenario, but we regard it as a prudent target to worry about."[148]

The sobering discovery that a clandestine plutonium reprocessing plant might give Pakistan a nuclear weapons capability much earlier than had been feared also focused attention on the country's only nuclear power plant, a Canadian-built (Kanupp) heavy water reactor near Karachi. In some 8 years of not overly successful operation, the Kanupp power station has produced spent fuel containing an estimated 220 pounds of plutonium—enough theoretically for perhaps 15 bombs. A worrisome possibility to Western officials is that some of the spent fuel, despite existing safeguards procedures, may have been diverted for use in the reprocessing facility. Another concern over the diversion of fuel arose with the September 1980 announcement by Pakistan that it is now fabricating its own nuclear fuel elements for the Kanupp power reactor, using natural uranium obtained from Niger.

US specialists stated that Pakistan, without much difficulty, could irradiate its own fuel elements in the Kanupp reactor and then ship them to the clandestine plant for reprocessing for use in a weapon. A source commented that it was "relatively certain that ... the material they put through the reprocessing plant will come from the Kanupp reactor."[149]

Prior to the discovery of the reprocessing facility, US officials in 1979 estimated that 3 to 5 years of construction and plant operation would be necessary to produce sufficient enriched uranium to produce a weapon, assuming that enough natural uranium fuel was available. Other estimates reduced the necessary additional time to as little as 2 years.

The Pakistanis also were reported to be limping along in continuing work on the facility abandoned by France, without French

assistance. About 6 to 10 years would be necessary to produce weapons-grade material at this site, according to knowledgeable experts. Furthermore, Pakistan is reported to have in operation a pilot "hot cell" reprocessing facility at the Institute of Nuclear Science and Technology in Islamabad, where small amounts of enriched uranium could be produced relatively quickly if the necessary materials were available.

Meanwhile, the United States, fearing a potential nuclear race on the subcontinent, for the last several years has attempted to dissuade Pakistan from developing a nuclear device. The steps taken or contemplated so far range from offers of additional conventional weaponry, including F-5 fighters, to the imposition of more severe economic sanctions.[150] US and other Western officials are convinced that Pakistani nuclear capability would serve to revitalize India's nuclear weapons program and further destabilize the political situation in the subcontinent, already subject to conflicting irrendentist claims, historical animosity, and continuing danger of war.

Despite such pressure, General Zia has stated candidly that no Pakistani government could compromise on the nuclear issue under threat of US or any other country's sanctions. "We do feel the pinch in a very hard way, but our sacrifice will have to be made unless, of course, the United States sees what is the reality," he said. In this regard, Western diplomats in Pakistan are reported to be in agreement with Zia that no government in Pakistan could buckle on the nuclear issue and survive in office.[151] In Pakistan, as in a number of other developing states approaching the atomic threshold, the nuclear development program has gone too far and has become too ingrained with national honor and prestige for practically any government to reverse course.

The December 1979 Soviet invasion of Afghanistan further complicated US plans to curb Pakistan's planned nuclear development. On the one hand, US officials have attempted to convince Islamabad that a minor nuclear weapons capability (1) would do little to deter the Soviet Union, (2) would probably cause Congress to ban all military shipments to Pakistan, and (3) could impel India to move militarily against Pakistan before the latter achieves a full-fledged nuclear capability. In this regard, the United States has been exploring the possibility of providing Pakistan with a substantial new conventional military aid package, reportedly valued at $400 million, and in arranging further military assistance from a consortium of Western

and Arab countries. Standing in the way of implementation of such a program, however, were both a congressional ban on military aid to Pakistan and general US Government nonproliferation policy.[152]

With the resuscitated possibility of a renewal of US arms transfers in the offing, reports have emanated from New Delhi to the effect that France would reconsider its cancelled sale of a reprocessing plant. However, a French government spokesman denied this, stating that the French policy statement of 16 December 1976 against nuclear proliferation was "still in the Bible for us." The French spokesman reiterated that there was no possibility of resuming the dormant nuclear negotiations with Pakistan.[153]

Pakistan, meanwhile, has yet to be convinced of the efficacy of relinquishing its nuclear development program. While the Pakistanis continue to supply assurances that they have no plans to acquire nuclear weapons, they have declined to disavow plans for building a "peaceful nuclear device," as India characterized its explosive device.[154]

The ambiguous Pakistani position on nuclear testing, with indications that progress is continuing on the uranium enrichment plant, continues to be viewed by Washington with serious concern and may yet jeopardize the US effort to strengthen Pakistan's conventional military capability. While the United States has deemphasized its concern with Pakistani nuclear plans following the events in Afghanistan, Washington has attempted to demonstrate that it remains serious over nonproliferation dangers. In the US view, a Pakistani nuclear test would not only create new tensions in the subcontinent and induce India to revive its nuclear weapons program, but would make it nearly impossible to achieve any regional cooperation designed to resist further Soviet encroachments in the area.[155]

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CHAPTER 5

POLITICAL-STRATEGIC FACTORS

THE NUCLEAR OPTION IN ISRAELI STRATEGIC THINKING

Public discussion of nuclear weapons and policy in Israel has been muted. Israeli press censorship, which normally applies only to the protection of military information, has been broadened in the nuclear area to encompass the status of Israel's nuclear development, the particulars of nuclear policy, and the possible uses of nuclear weapons in the nuclear option. Comprehensive analyses by Israelis, with few exceptions, have been limited to studies published outside Israel. Articles appearing in the foreign press on Israel's nuclear capability or plans have occasionally been reprinted, without comment, in the Israeli press, but any semblance of a public debate within Israel has been tightly constrained.

In examining published Israeli commentary on the nuclear question, one gains the impression that the preponderance of opinion is opposed to exercising the nuclear option, but not to keeping the option open. This impression, however, overlooks the fact that proponents in the debate are in a more delicate position than opponents. Much, for example, has been made of the December 1974 acknowledgement of Israeli President Efraim Katzer that Israel has "a nuclear potential."[1] While closer examination of this remark does not add anything significant to the official Israeli position that Israel will not be the first to introduce nuclear weapons in the Middle East, the comment in itself generated considerable attention in the world press. This underscores the fact that any laudatory or positive comments on a nuclear capability published in Israel inexorably attract considerable attention, especially if the source is identified with the government. Occasional, oblique references to the advantages of "strategic independence" or nuclear stability have appeared in the Israeli media, but such instances have been rare. By default, public discussion has devolved largely to the opponents of nuclearization. All that one can definitely conclude from Israeli public discussion of the nuclear option is that conflicting views on the subject exist within Israel—hardly a resounding conclusion.[2]

Given the dearth of public information on Israeli treatment of the nuclear question, one can only attempt to reconstruct Israeli positions on the various objectives of a nuclear capability as viewed from Jerusalem. The more plausible objectives appear to be the following:

Offsetting An Arab Nuclear or Conventional Military Capability

The necessity of countering a possible Arab nuclear capability probably serves as a basic Israeli justification in keeping the nuclear option open. A prospective Arab nuclear capability undoubtedly looms large in Israeli contingency planning. The most generous estimates put the minimum lead time for a crash nuclear program by Iraq—the most serious Arab contender—at least 5 years away. Moreover, no nuclear power has indicated an interest in transferring any nuclear armament to an Arab country. The most realistic basis for such a transfer, in fact, would be Israel's "going nuclear" first. Consequently, the counternuclear argument may provide some justification for Israel's retention of a nuclear option, but it argues against moving to an avowed nuclear status, which would help bring about the very danger it was intended to offset.

Another sobering thought for Israel is the relative vulnerability of the country to a nuclear attack as compared with the vulnerability of her current, primary Arab antagonists, Iraq and Syria. The two main Israeli population centers, Tel Aviv and Haifa, and the coastal region between them represent the core of Israel's economic heartland, as well as the center of the israeli military command and control structure. Consequently, only two well-placed, nominal-yield nuclear weapons would virtually destroy Israel's population centers, military command centers, economic infrastructure, and access to the sea. Arab forces could even avoid the step they would find inimical to their ultimate interests—a nuclear attack on Jerusalem.[3]

While the major cities of both Iraq and Syria are similarly vulnerable to a limited nuclear strike, in no way would several nuclear weapons achieve the same overall catastrophic effect (because of area and population differences) as would a nuclear attack on Israel. Thus, the Israelis have no choice but to maintain a first strike capability designed to preempt and nullify a perceived Arab nuclear threat.

In this respect, the French decision in 1980 to supply enriched uranium to Iraq produced a not unexpected Israeli reaction of grim foreboding. Israel had already been linked in foreign press speculation to two other actions against Iraq's nuclear potential—the sabotage in 1979 of the two French reactors in Toulon just prior to their planned shipment to Iraq, and then the unsolved murder of a top Iraqi nuclear scientist in Paris in June 1980. After shipment of the first French consignment of uranium to Iraq, the Foreign Affairs Committee of the Israeli Knesset issued a statement noting that Iraq, following the war of 1948, had never signed an armistice agreement with Israel, as had the other Arab states, and that a state of war still technically existed. "When an extremist and aggressive regime such as Iraq's gets nuclear manufacturing potential, Israel must regard the development as a threat to its existence," said the statement. "Israel will therefore have to make a sober assessment of its response."[4]

Meanwhile, the possibility of another Arab conventional, large-scale attack on Israel remains the constant preoccupation of Israeli military planners. Although the Camp David accords have effectively eliminated Egypt as the most serious and potent adversary on the Arab side, the Israeli Defense Forces cannot afford the luxury of downgrading their continued high level of readiness. A single military defeat still remains one too many for Israel. In such a circumstance, if an enemy force threatened a breakthrough into the Israeli heartland, a nuclear option—which otherwise might appear irrational—would likely be perceived as serious by an attacker, even if the latter also possessed such weapons. It is fair to assume that Isreali planners will most likely continue to counter a conventional military threat with their own conventional forces. On the chance, however, that one day such means for whatever reason will not suffice, the nuclear alternatives, from the Israeli perspective, might be too prudent to do without.[5]

Maintaining the Status Quo

Aside from the reputed military advantages accruing from the possession of nuclear weapons, what political benefits may result from their possession? A commonly-expressed interpretation by some specialists is that by going nuclear Israel could "freeze" the status quo or even impose peace on the Arab states. Proponents of this view argue that even if the Arabs achieve a nuclear capability matching that of Israel, the resulting "balance" need not be unstable and would probably cause Israel to solidify its hold on the remaining

portion of the occupied territories, thus manifesting to the Arab countries the futility of further warfare.

Paradoxically, other observers maintain that the possession of nuclear weapons would enable the Israelis to do just the opposite, i.e., withdraw from the occupied territories, because of the enhanced security resulting from the nuclear option. This option, however, cannot work both ways. It cannot both lock and unlock the territorial question. This dilemma underscores the uncertainty over exactly what political impact, if any, accrues from possessing or demonstrating a nuclear option.

Deterring Soviet Intervention

Some analysts (although few Israelis) maintan that an Israeli nuclear weapons capability could counter a Soviet threat to the existence of Israel, or at a minimum place limitations on Soviet activities in the Middle East. The plausibility of this position rests on an inordinately grandiose interpretation of Israeli capability to threaten the USSR itself. Although it would be barely possible for Israeli aircraft, with aerial refueling, to reach some of the southernmost cities of the Soviet Union, to say that such a mission would be suicidal—to the attacking aircraft and to Israel itself—is an understatement. The question to be considered, therefore, is that, because of the suicidal nature of the threat, would it be credible to Moscow?

It seems fairly reasonable to assume that only in the extreme case of an actual Soviet threat to the very existence of Israel would such an Israeli counterthreat be at all credible. However, the Soviet threat to Israel has never been direct, but has been reflected primarily in the Soviet equipping of the Arab armed forces. Should the eventuality of a direct Soviet conventional or nuclear threat to Israel ever arise, Israel's optimal recourse is likely US reaction exemplified in the worldwide US military alert of October 1973.

Reducing Dependence on the United States

It has been argued by some US observers that Israeli dependence on the United States has assumed "unprecedented dimensions" since the October war. They further aver that the new dependency relationship bodes unfavorably for Israel in view of Washington's other interests in the Arab world, the West's increasing dependence on oil, and the unpredictability and unsettled nature of

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US-Soviet relations. Therefore, it could be argued that Israel's discreet introduction of a nuclear option would reduce the risk to both Washington and Jerusalem by solidifying its "permanence"—apart from US support—in the Middle East.

Critics of this view hold that an announced nuclear status would not reduce Israel's needs for modern conventional arms and its dependence on Washington, but in fact would further increase Israeli requirements for external support, particularly financial. At this very time, however, an openly-declared nuclear capability might very well antagonize Washington and make continued assistance much more problematic. Moreover, other consequences, including an increased level of Soviet assistance to the Arab states and probable diplomatic isolation, would add to the enormity of the political costs for Israel. This is not to say that the risks of external dependence should not be of concern to Israeli decisionmakers, but opting for a nuclear capability primarily for this reason would be "very much second-best to continued dependence on the United States."[6]

As far as the effect a nuclear capability would have on Israel's bargaining position vis-a-vis the United States, a public nuclear stance in one sense would tend to negate much of the bargaining power Israel presently enjoys as a nuclear threshold state. While the nuclear option remains available, but unused, it cannot help but have a substantial infuence on bilateral negotiations for modern arms and other assistance.[7]

In another sense, however, Israel could use its nuclear capability to increase diplomatic leverage on the United States, as well as to influence the involvement of both superpowers. An illustration: in the event of a renewed Arab-Israeli war, which ensued with no early resolution in sight, Israel could detonate a nuclear weapon as a warning and threaten strategic use against the opponent's cities unless the superpowers intervened to stop the war.

Because of the superpowers' concern over proliferation, the Israelis can be expected to "ask a fair price" for even temporary foregoing of the nucear option. Once the latter option is exercised, however, this leverage would dissipate. In sum, while the usefulness of nuclear weapons as a bargaining instrument can be overrated, this factor should not be taken lightly.

ARAB PERCEPTIONS

During the 1960s, when the reputed Israeli nuclear capability was in its nascent stages, two basic Arab reactions became evident. One approach, which gradually evolved into the position of the Syrian government, was that guerrilla action could eventually "solve" the Palestinian problem, and that nuclear weapons would be ineffective against such operations. Such an approach could maintain prolonged pressure against Israel, without necessarily escalating into full-scale conventional war. At the same time there were Arab fears that an Israeli nuclear capability might stabilize the status quo.

The second approach, advanced primarily by Egypt, reflected the view that an Israeli nuclear capability would threaten the Arab world and shift the balance of power in Israel's favor. The influential Egyptian editor of *El Ahram*, M. Heykal, suggested several options for the Arab states as follows:

(1) Waiting until the Israelis obtained or declared a nuclear capability, then acting in the most propitious way at that time;

(2) Participating in a technological race to develop an Arab nuclear capability, leading to a "nuclear balance," but with the concomitant result of postponing a solution of the Palestinian problem;

(3) Relying on political action by the international community, notwithstanding the world's typical acceptance of an existing situation as preferable to any alternative; or

(4) Acting preemptively (by nuclear or conventional means) before the Israelis readied their nuclear capability and solidified their military superiority, thus keeping open the option of another attack on Israel.

The anxieties caused by Israel's continuing nuclear development program caused the Arab confrontation states to pursue several alternative policies:

(1) To pursue efforts at acquiring an independent nuclear capability;

(2) To persist in a conventional arms buildup;

(3) To attempt to obtain nuclear technical assistance from Moscow or, failing that, from other nuclear supplier states.

(4) To request nuclear guarantees from the Soviet Union to prevent an Israeli nuclear attack;

(5) To encourage diplomatic activity designed to achieve a "nuclear-free zone" in the Middle East, but only for as long as suited Arab purposes; and

(6) To dissuade Israel from going nuclear, either by (a) an Arab threat of a preemptive attack on Israel, should the latter reach the nuclear threshold stage, (b) persuading the United States and Soviet Union to put pressure on Israel to forego the nuclear option, or (c) to threaten to develop an Arab nuclear capability, if the Israelis did so first.[8]

With regard to a preventive strike, President Nasser raised the issue as early as February 1966, when he declared in a press conference, "If Israel produces the atom bomb, then I believe that the only answer to such an action would be preventive war." He continued that the Arab states "would have to take immediate action and liquidate everything that would enable Israel to produce the atom bomb."[9]

Apart from the possibility of a preventive war, the Arab states also attempted to use the threat of going nuclear themselves as a deterrent against the Israeli nuclear option. Because of the technological gap between Israel and the Arab states, particularly during the sixties and seventies, however, this particular form of deterrent has been emphasized less than the possibility of preventive war.[10]

Another facet of the nuclear question in the Middle East may lie less in the Arab-Israeli relationship than in the inter-Arab relations. President Sadat, for example, may not have shared the ambitious dreams of Arab unity espoused by his predecessor, Gamal Abdel Nasser. Such may not necessarily hold true for Sadat's successors, who may be more sensitized toward a desire to reestablish Egyptian preeminence in the Arab world. Regardless of the status of the Egyptian-Israeli rapprochement over the next several years, an Egypt with even a rudimentary nuclear capability would be in an excellent position to represent the interests of all the Arab states in negotiations to recover the remaining occupied territories. Among other

results, such a posture would be especially beneficial in enhancing Egypt's standing in the Arab world and possibly in reestablishing financial support from the oil-producing states. Beyond this scenario, a nuclear-armed Egypt, freed of the necessity to maintain strong forces on the Sinai front, may be more inclined to consider various adventures on the Libyan frontier or other areas in Africa. While such possibilities may not be particularly likely, the Middle East is not known for its predictability.

The final portentous question is what has been or would be the Soviet response if an Arab state requested a Soviet nuclear guarantee. The evidence here is uncertain and contradictory. The Egyptians, for example, are reported to have asked Marshal Grechko for such assistannce in December 1965, when he visited Cairo, although the Egyptians have denied this report. In December 1974, the Soviets are reported to have provideed some sort of nuclear guarantee to Egypt, Iraq, Syria, and Algeria, in the event it was proven that Israel had nuclear weapons in its possession.[11] It may very wll have been the case, however, that such a pledge, if actually given, was not a guarantee itself, but merely "a promise to give a guarantee" if certain future conditions were fulfilled.

The potential benefits to the Soviet Union from such a guarantee would be obvious, i.e., increased Soviet influence in the Arab states and the possible dissuasion of Israel from utilizing a nuclear option. Contrariwise, such a pledge, if forced to be honored, might embroil the Soviet Union in a possible nuclear or conventional war in the Middle East and a likely possibility of US intervention, the consequences of which Moscow could not consider lightly.[12]

NUCLEAR OPTIONS IN AN ARAB-ISRAELI CONFLICT

Two different sets of circumstances involving nuclear weapons can be postulated. The first and more likely situation applies to only an Israeli possession of a nuclear capability, whereas the second pertains to a scenario wherein both Israel and an Arab state have such a capability. In the first situation, it is assumed that the Israelis have found it necessary or expedient to declare a nuclear capability, most likely couched in terms of deterrence vis-a-vis the Arab states. It is not difficult to construct various circumstances wherein Israel might announce a doctrine of deterrence, but it is more problematic to imagine how such a policy would be formulated and implemented.

A common assumption is a conventional Arab attack which has broken through Israeli defensive positions and threatens the Israeli heartland.

It is not difficult to envision an Israeli decision to use nuclear weapons at this point, but the manner is difficult to visualize. The response would depend largely on the actual military situation and the size and quality of the Israeli nuclear force. A sizeable number of dispersed or protected weapons would allow numerous options, but reduced availability of weapons would severely restrict available choices. Cairo, Damascus, and Baghdad might be threatened or attacked, but this might not suffice to immediately stop an Arab ground attack. Unless Israel could follow up a warning detonation with the threat or execution of attacks on Arab cities, the ultimate consequence for Israel would likely be defeat, rather than a cease-fire.

A danger of Israel's reliance on a token nuclear force with the capability of attacking a handful of Arab targets is the possibility that the bluff might be called. Here the vulnerability of the nuclear force would be critical in the planning of where and how it would be used. Constructing a hardened, second-strike force would require an elaborate capital investment, which, at the present stage of Israeli development, would not appear practical or likely.[13]

The most believable purpose of an Israeli nuclear capability would be use as a weapon of "last resort" deterrence. While the force requirements would be relatively simple, such a deterrent force would not require advance public avowal of the existence of atomic weapons. A policy of secrecy would preserve Jerusalem's negotiating leverage as a potential nuclear power, thus averting the costs of declared nuclear status. Concomitantly such a policy would not present adversaries with opportunities of neutralizing the deterrent before it could be invoked. The general motives that would impel Israel to publicly brandish such armaments—prestige, political exploitation, reduction of dependence—appear to be inapplicable or unrealistic in Israel's case.

Practically as important as the Israeli decision whether or not to develop nuclear weapons is the question whether to reveal publicly what has been decided. It is at least conceivable that Israel might wish to conceal a decision *not* to build a weapon. In any case, the major existing options for Israel vis-aa-vis a disclosure decision would seem to be: (1) a disclosed nuclear weapon status, (2) a disclosed no-weapon status, (3) public silence, with no weapons development and (4) public silence, with secret weapons development.[14]

The option of a *disclosed weapon status* evokes such questions as the political price of disclosure, the rather limited usefulness of deterrence, and the stability of a nuclearized Middle East. The price of disclosure, as discussed above, would indeed be huge. Such an announcement would aggravate hostility and promote unity among the Arabs as perhaps no other single development would. It would, in all probability, call forth greater and more encompassing commitments on the part of the Soviet Union for greater military support, with the possibility of a nuclear guarantee not to be excluded. Finally, the impact on Israel's relationship with the United States would undoubtedly be profoundly negative.

As for the deterrence aspect, a deterrent force must be known to exist publicly for it to fulfill its purposes. As a "last resort," however, advance public knowledge of the force does not seem critical. Advance notice in fact might be self-negating, inasmuch as it would provide time for counteractions and counterthreats. In the Israeli case, where a true crisis threatening the existence of the country is not that likely to arise so precipitously, it would appear more useful to conceal the existence of the deterrent force until the moment when needed.

The most serious consequence of a disclosed nuclear status, however, remains the likelihood that a nuclearized Middle East would become even more unstable and dangerous to regional and world peace than heretofore. There seems little doubt that an Arab nuclear capability would follow the Israeli acquisition of such a capability, with only the intervening time period being uncertain. As such, many observers agree, the exposed vulnerability of both sides, the existing delivery means already at hand, and the tradition of surprise attacks in the region would inexorably heighten the dangers of preemption. With each side constantly fearing the other's first strike and planning to anticipate it, nuclear war could be ignited by any combination of suspicions and tensions.

Adopting a *disclosed no-weapon status* would presumably mean adhering to the NPT. Such action would not equate with permanent foreclosure of the nuclear option, but it would necessitate either considerable confidence in Israel's ability to foresee the imminence of last-resort circumstances or a disposition to rely on outside guarantees. Whatever the likelihood of Israel's benefitting from either of these possibilities, neither would address the most likely threat facing Israel: an overwhelming conventional attack. Not only is no Is-

raeli government likely to rest its security on outside guarantees, but there would appear to be no compelling incentive to renounce the bomb publicly. Any immediate benefits in relations with the United States would be offset by the evaporation of negotiating leverage. Furthermore, the advantages of ambiguity in maximizing uncertainty among the Arab states would be forfeited. Assuming an imminent possibility of Arab nuclear capability, there might be some Israeli incentive to seek a mutual pledge abstaining from a nuclear option. But barring such a possibility, and despite the fact that foreswearing this option need not be irrevocable, it is extremely unlikely to expect Israel to renounce nuclear weapons publicly.

Supporting the option of *public silence, without weapons development,* is the extreme unlikelihood of a threat to Israel's survival developing suddenly. Proponents of this option would argue that the development of a nuclear weapons capability before a serious threat to Israel's survivability appears on the horizon would serve little purpose and would be subject to discovery. Premature disclosure would again lead to some of the problems and possible neutralization discussed above.

As for *public silence, with secret weapons development,* it may be argued that so long as Israel has no plan to foreclose the nuclear option, there is no compelling reason to stop anywhere short of the fnal product. Viewed from this perspective, discovery is considered unlikely, and in the last analysis, who could disprove an Israeli denial? The rapid pace of events in the region would appear to make it prudent to many Israelis to have the weapon on hand for all contingencies, just in case. In any case, the question of "possession of weapons" is to a considerable extent a matter of definition. In this respect, is an assembled, or nearly-assembled nuclear device, which has never been tested, considered to be a "bomb-in-the-basement" or an untested option?

The other side of the nuclear question in the Middle East embraces a possible scenario wherein both Israel and an Arab state possess nuclear weapons. As discussed above, the capabilities of the two sides are likely to be asymmetric. As a result, an Arab declaratory policy might have more impact than a similar one by Israel. At the same time, a small and vulnerable Arab nuclear force would offer an exceedingly tempting target for an Israeli preemptive strike at the onset of any hostilities, or even before. An Arab declaration

announcing a nuclear option could in fact serve as a cause of war to the Israelis.[15]

In sum, the above discussion has attempted to counter the thesis, advocated by some observers, that the acquisition of nuclear weapons by Israel or any Arab state would introduce a semblance of "stability" in the Middle East. On the contrary, such a development would likely upset the delicate military situation that now exists in the region and perhaps lead to an even more disastrous conflagration than the region has yet experienced.

NUCLEAR TERRORISM

Terrorist groups in the Arab world no longer abide by any code of honor that differentiates between combatants and noncombatants. Engaged in what has been described as "total war against nations, ethnic groups, and religious,"[16] such groups vent their anger quite randomly. Consequently, traditional terrorist political assassinations in the Middle East have been replaced in part by such indiscriminate acts of terrorism as the murder of the Israeli athletes and school children, the killing of Christian passengers at an Israeli airport, and the explosion of bombs in Jerusalem.

The meaning of the word *fedayeen* is "self-sacrificers." The meaning should be taken seriously, inasmuch as Palestinian terrorist groups generally put a higher value on achieving certain political objectives than they place on their own lives. As such, terrorist groups may be insensitive to the threat of retaliation that lies at the heart of the principle of deterrence. With the logic of deterrence thus nullified, governments using counter-terrorist measures may be at a serious disadvantage. Having no inhibitions against the use of maximum force directed at any segment of the population and perceiving themselves in a "no holds barred" situation, Palestinian terrorists view the amount of suffering they can inflict to be limited only by the availability of weapons.

What does this type of behavior imply for the threat of nuclear terrorism in the Middle East? Assuming that a *fedayeen* terrorist group were to obtain an atomic device and calculate the likely costs and benefits of its use, it is quite likely that fear of retaliatory destruction would be excluded from such calculations. The usual and rational threats of deterrence accordingly would have little bearing on the terrorists' decision on whether or not to use a nuclear device. Conse-

quently, if diplomatic or similar forms of persuasion should prove unsuccessful, the threatened nuclear act could only be prevented by a surgical, preemptive strike.

The probability that a terrorist group could obtain a nuclear device does not appear high at present, but it is not beyond the realm of possibility. The Palestine Liberation Organization (PLO) is the most viable candidate, given its organization, its international contacts, and its availability of funds. How a nuclear device would be employed and results of its threatened use would be difficult to visualize. The probability of Palestinian acquisition of, and threats to use, such a weapon, should the Middle East peace process encompass the Arab states at Palestinian expense, is substantial. Whether a *fedayeen* group would target Israel, another Arab country, or a Western nation is impossible to predict, but a situation wherein Palestinian demands were buttressed by nuclear extortion is at least imaginable.[17]

In such circumstances, a good possibility exists that the initial response would be toward compromise with the Palestinians, depending on the nature of their demands. At the same time, the revulsion of most states at this type of nuclear blackmail could, in all probability, lead to some constraints on the relationship between the Palestinian groups and the Arab governments. Consequently, from the PLO perspective, the threatened use of a nuclear device might be a "do or die effort." Such type of nuclear threat would likely strengthen the resolve of Israel or many of the Arab states not to give in to terrorist pressures, even though some short-term compromise may initially be necessary.

A terrorist group could benefit in a variety of ways from a demonstrative detonation or threatened use of a nuclear weapon. Such a group would first of all gain enormous publicity from either the possession of a nuclear device, no matter how crude, or even the purported possession of one. Being the first group to use this means of blackmail or pressure in an entirely new domain would leave an indelible mark on the world's psyche. Moreover, inasmuch as a nuclear power is not likely to disappear very readily from the world scene, this factor would provide the Palestinians, for example, with a psychological guarantee against extinction. Besides the threatened use of a nuclear device, the mere possession of it by the Palestinians would pay enormous political and psychological dividends.[18]

The position of some *fedayeen* groups, as epitomized by ideologues such as George Habbash, leader of the Popular Front for the Liberation of Palestine, is that any political settlement allowing the existence of Israel as a state is equivalent to surrender. Accordingly, in this genre, war resulting from a nuclear provocation is more desirable than an unacceptable settlement. Habbash himself has stated: "We want to look forward anxiously to a new war. . . . A new war is no danger to the Palestinian people. They can't suffer any worse than they have since the 1948 creation of Israel on their homeland."[19]

While the utility of nuclear blackmail may thus be attractive to some elements of the Palestinian leadership, the actual use of a nuclear device entails such grave risks that the more moderate leadership elements would be loathe to take them. Whether the more extremist leadership factions would prevail in the decision to use nuclear weapons against Israel or a conservative Arab state, irrespective of the ultimate costs to the Palestinian cause, remains a subject of conjecture.[20]

Exacerbating the threat of nuclear terrorism in the Middle East is the increasing cooperation among terrorist groups. Such cooperation is exemplified in the training provided Japanese Red Army and IRA members by *fedayeen* groups in Lebanon and the demands by Arab Black September operatives in Munich for the release of German Baader-Meinhof terrorists involved in the killings of German policemen.[21]

Such cooperation increases the opportunities for terrorist groups to acquire nuclear materials, technology, or eventually even a complete device. Moreover, a cooperative terrorist network operating across international boundaries facilitates possibilities for penetration and illegal entry of terrorist operatives and establishment of safe havens.

The most direct way for a terrorist group to acquire a nuclear weapon obviously would be the seizure of one through assault on a nuclear storage area or reactor facility of a nuclear power. Given the likely security measures taken to guard such facilities, this type of operation would prove difficult and costly to the terrorists, but it would remain possible. A far simpler method would be transfer of a device to a terrorist group from a sympathetic government, most likely on a covert basis to avoid retaliation.[22] If Israel were the threatened state, however, it is likely that Israeli suspicions of Arab gov-

ernment complicity would evoke an Israeli warning that Baghdad or Damascus would not survive if terrorist nuclear threats were directed against Israel proper.[23] Clearly such a situation could easily evolve into a major war.

Aside from the suspicions of foreign government involvement, the manifestation of nuclear terrorism would cause perceptions of a more dangerous international environment, and likely increase pressure on states to acquire nuclear weapons "just in case." Implied would be the prestige factor, reflected in the question, "How can we, a nation of importance in the world, not have nuclear weapons when even terrorists have them?"[24]

The possession of an actual nuclear weapon would not be necessary to serve terrorist purposes. Far simpler to fabricate than a nuclear explosive and still highly effective for blackmail purposes would be a plutonium dispersal device, another insidious radiological weapon. Plutonium itself ranks among the most toxic substances known. It is approximately 20,000 times more deadly than cobra venom or potassium cyanide and about 1,000 times more toxic than even modern nerve gasses. While sounding a bit like science fiction, a single speck of plutonium, if inhaled, is likely to cause lung cancer, while a few thousandths of a gram of tiny particles (about the size of a pinhead), if inhaled, will cause death in as little as several weeks. An amount as small as 100 grams (3½ ounces) could prove a deadly risk to al the inhabitants of a large office building or factory, if introduced into the ventilation system.[25]

In quantities smaller than one kilogram, plutonium could be attached to several pounds of conventional high explosives to threaten cities with sudden, deadly contamination. The complex and time-consuming difficulty of decontaminating an affected area would exacerbate the potential threat. The capability of generating such a severe psychological impact on a threatened government, through holding wholesale populations at bay, without the necessity of procuring or producing a nuclear explosive, might make such a measure especially attractive to terrorist groups.[26]

CHAPTER 5 ENDNOTES

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CHAPTER 6

CAN NUCLEAR WEAPONS BE FORESTALLED IN THE MIDDLE EAST?

The various protective measures and approaches offered to forestall the introduction of nuclear weapons in the Middle East, as offered in this chapter, attempt to take into account the dilemmas faced by proponents of nonproliferation. Even if all of these risk-reducing measures were fully implemented by nuclear suppliers and users in the Middle East, there would still remain some degree of risk of national or subnational diversion of nuclear materials and facilities. No absolute preventive assurances are feasible in present circumstances.

Nevertheless, the difficulty of eliminating every potential danger of nuclear proliferation does not detract from the criticality of minimizing, to the greatest degree possible, the chances of such occurrence. The suggested antiproliferation measures are worth pursuing, even if they only postpone the time when a country goes nuclear.

In general, a national decision to opt for a nuclear weapons capability will be governed, not so much by the technical ease or economic cost of the task, as by the motivations of a country's leaders, based on perceptions of national self-interest.[1] The nurturing of conditions supportive of political restraint on this question becomes ever more critical as the diffusion of nuclear materials and technology continues to erode the remaining technical and economic barriers to proliferation.

INCENTIVES AND CONTROLS

Nonproliferation policy in effect since the 1950s has rested on twin pillars of positive incentives and controls or sanctions. Among the prime incentives offered have been assured guarantees of nuclear fuel materials, equipment, and technical assistance.

An assured supply of uranium reactor fuel is basic under these conditions. For most commodities, world market forces determine

supply and demand, but nuclear materials, of course, do not fall into this category.

For some two decades after 1945, the United States maintained a near monopoly on the export of nuclear materials. By the late 1960s the US monopoly began to dissipate with the appearance on the world market scene of the Western European supplier state and the Soviet Union. These developments have weakened, but not expunged, the usefulness of supply guarantees as an antiproliferation tool.

Firm supply assurances in exchange for cooperation with US nonproliferation objectives can still serve as a highly useful antiproliferation measure. Agreements implemented on a bilateral basis can still remain the primary mechanism of supply. Such bilateral deals can be supplemented by secondary supply arrangements with other suppliers, which would come into play should the main supply relationship be interrupted for reasons unrelated to proliferation violations. As a final guarantee, some type of international organization, perhaps linked with IAEA, could be established for purposes of stockpiling and distributing uranium fuel to countries still in compliance with nonproliferation commitments, but whose bilateral fuel supply arrangements had been interrupted because of other causes.[2]

Sanctions

The deterrent potential of nonmilitary sanctions, unilateral as well as multilateral, merits serious and careful analysis in considering future nonproliferation strategy. Sanctions can assist in fulfilling three broad requirements:

(1) the dissuasion of potential proliferations;

(2) prevention against the erosion of safeguards; and

(3) reinforcement of international norms against proliferation.

A list of potential sanctions might include the following:

— Termination of all forms of nuclear cooperation and expulsion from the IAEA;

— Cessation of all military assistance, sales, and training;

— Withdrawal of a prior security guarantee;

— Withholding of economic assistance;

— Blocking of access to Export-Import Bank and World Bank loans;

— A ban on private investment in the country in question;

— Expulsion of a country's science and engineering students;

— Termination of landing rights for a country's airline, prohibition of tourism to and from it, and severance of communications and representation.[3]

ESTABLISHMENT OF A NUCLEAR-FREE ZONE

Apart from the direct approach to nonproliferation embodied in the NPT, a more indirect approach is represented by the concept of a nuclear-free zone. Although this concept has taken various formats when advanced by different proponents in various regions of the world, it generally bars the acquisition of nuclear weapons by a particular country, as well as totally prohibits them from being introduced, stored, or deployed anywhere within a given region.

The Latin American Nuclear Weapon-Free Zone, embodied in the 1967 Treaty of Talatelolco, provides a working example of a regional approach to nonproliferation which could be emulated in the Middle East. Only formal ratification by Argentina and Cuba, and French and US ratification of Protocol I, are lacking for the treaty to be fully implemented in all Latin American countries. The treaty prohibits nuclear weapons in the region, requires full scope IAEA safeguards on each country's nuclear activities, and requires all nuclear powers to refrain from contributing violations of the treaty and from threatening the use of nuclear weapons against signatory states. Drawbacks to the treaty include the differing interpretations of some parties regarding the legality of peaceful nuclear explosions and the fact that the treaty is not fully in force for several regional states having significant nuclear programs.[4]

In 1974, Iran—with the subsequent cosponsorship of Egypt—proposed the establishment of a nuclear-free zone in the Middle East. The UN General Assembly, in December of that year, en-

dorsed the proposal and requested that all countries in the area agree to refrain from producing, acquiring, testing, or in any other way possessing atomic weapons. The UN body concurrently called on all states of the region to accede to the NPT, and requested the Security General to ascertain their views and report to the Security Council and to the General Assemby.

Unlike the Latin American proposal, there was no prior consultation with other states in the region, particularly Israel. Furthermore, due to the state of belligerency between Egypt and Israel, the former's cosponsorship of the proposal evoked the natural suspicion that Egypt may conceivably have had some military or propaganda advantage to gain by its action. Consequently, while the General Assembly's endorsement of the proposal did not call on the regional states to consult with one another, but only requested the ascertainment of their views, the proposal did not have very favorable prospects of succeeding.

Not too surprisingly, Israel at that time and for the following several years withheld its support of the Assembly's resolution. All the nuclear powers, including India, voted for the proposal but, without Israel's concurrence, the resolution led nowhere.[5]

With the signing of the 1979 Egyptian-Israeli peace treaty, however, the political complexion of the Middle East changed sufficiently to cause Israel to abandon its prior resistance to a regional antinuclear pact. In November 1980, Israel, in a major policy shift, voiced its support of an Egyptian resolution calling on Middle East nations "to declare solemnly that they will refrain ... from producing, acquiring or in any way possessing nuclear weapons and nuclear explosive devices." These "solemn declarations" were to be deposited with the UN Security Council.[6]

A melange of military and political considerations apparently lay behind the new Israeli position. Israel's UN ambassador indicated that the new policy reflected the necessity of doing "something more concrete about the creation of a nuclear weapons-free zone." The timing, he stated, was dictated by the attempt of a number of countries in the Middle East to achieve a nuclear capability, principally Iraq, and, in the adjacent region, Pakistan. On voting for the Egyptian resolution, the ambassador remarked, "We want to give an earnest [sign] of our good will by joining the Egyptian draft."

Despite its support of the Egyptian proposal, Israel is dissatisfied with the plan, which calls for all states in the region to sign the NPT. Israel feels this is not strong enough and wants a conference, modeled after that initiated by Mexico in 1967 to cover Latin America, to work toward a "contractual assurance" of all the regional states to abstain from introducing nuclear weapons into the region. Israeli diplomats concede that there is no chance that the Arab states will join a treaty-writing conference any time soon. By their very participation in such conference, the Arab countries would be tacitly recognizing Israel's right to exist, which in itself would make such a convocation unlikely. In any case, the new Israeli position is a gesture of reciprocity toward Egypt, and serves to strengthen relations between the two countries.

In the absence of the establishment of a comprehensive peace between Israel and the Arab countries, it is unrealistic to suppose that a country can be maneuvered by political gamesmanship into accepting nuclear-free status. No state will acquiesce in such a treaty or remain a party to it after subscribing unless it sees such action unequivocally in its interest.

The argument can still be made, however, that the concept of a nuclear-free zone remains a useful and workable one. It can provide a means whereby nonnuclear states, on their own initiative, can enhance their security and that of the region as a whole. Moreover, it can be an efficacious instrument not only to prevent nonnuclear states from going nuclear, but also to acquire guarantees from the nuclear powers not to use or threaten the use of nuclear arms against any member state in the region. As such, a nuclear-free zone offers a very useful and effective means of promoting and enhancing the nonproliferation regime.[7]

Technological Assistance

As another inducement for Israel to foreswear the use of nuclear weapons, as well as withdraw from the occupied territories, the United States might consider some type of firm commitment to assist and provide Israel with the latest in electronic reconnaissance and early warning equipment. While the United States has already provided Israel with some of the latest RPVs, sensors, and other reconnaissance gear designed to improve Israeli tactical intelligence collection,[8] this should continue and perhaps be formalized as well in

continuing guarantees to maintain the highest possible degree of Israeli confidence in early warning.

Strengthening the NPT

The NPT accord still serves as the principal international diplomatic and legal instrument for inhibiting proliferation. The United States should do what it can to see that treaty is retained and strengthened. It accordingly should receive continuing high level US support, and nonmembers should be persuaded to sign and ratify it. In the latter regard, the United States should continue to attempt to create incentives for nonmember states to accede to the treaty, incuding making the transfer of nuclear fuel and equipment conditional on a recipient's signing of the NPT and full acceptance of the safeguards contained in the treaty.[9]

Adopting a Comprehensive Test Ban Treaty

The United States should continue to pressure the Soviets to agree to the comprehensive test ban treaty, which would ban any further testing of nuclear devices of any type, including peaceful nuclear explosions (PNEs) or underground tests. Among other effects, such a test ban would help to diminish the importance of nuclear weapons in world politics, would indicate that the nuclear powers are seriously adhering to the provisions of the NPT, and would politically complicate the intentions of a near-nuclear state to take the PNE route to a nuclear weapons capability. These positive results would outweigh the counterarguments of opponents who contend that such a treaty would slow progress in atomic weapons development, reduce the reliability of the existing nuclear stockpile, lower restraints against a technological breakthrough by a potential adversary, and expedite the transfer of skilled manpower away from weapons research and development.[10]

PLEDGING NONUSE OF NUCLEAR WEAPONS AGAINST NONNUCLEAR STATES

A useful inducement in persuading states to foreswear the nuclear option would be the provision of assurances guaranteeing their security against blackmail, pressure, or aggression by a nuclear-armed adversary. A twin-faceted form of assurances could be offered: the first would extend a positive guarantee by the nuclear powers to protect nonnuclear states if they are threatened or at-

tacked with nuclear armaments, while the second would offer a negative assurance by the nuclear powers not to threaten these states with nuclear weapons.[11]

At the same time, considerable caution would be called for in the exercise of such a pledge because of possible doubt arising over the credibility of US security guarantees to European and Asian allies. Accordingly, a nonuse pledge might be accompanied by a provision that the pledge would not apply to nonnuclear countries that assist a nuclear state in aggressive action against allies of the United States. If such a pledge should prove satisfactory to US allies and were subscribed to by other nuclear states, it would reduce the likelihood of nuclear weapon use and indicate the diminishing political utility of nuclear armaments in the foreign policies of the nuclear powers, and thus prove fundamentally reassuring to nonnuclear countries.

Offering Security Guarantees

One can anticipate the conventional military threats to nonnuclear states will continue as the primary stimulants to nuclear proliferation in the Middle East and elsewhere. By extending appropriate security guarantees through the UN, the superpowers acting in concert, or regional political mechanisms, the political feasibility of which would be difficult to predict, some nuclear threshold states could possibly be dissuaded from going nuclear and perhaps persuaded to accept other restraints. The current proposals for the United States entering into credible long-term commitments appear slim. Any such possibility would be made even more problematic by conditions demanded by nonnuclear states involving large-scale economic and security assistance. Moreover, international guarantees could result in freezing a status quo viewed as unsatisfactory from some points of view, and could mean international or superpower involvement in regional disputes otherwise viewed as undesirable. Nevertheless, in an environment of potential extreme nuclear hazard, an insertion of extraregional power might seem the lesser of two evils.[12]

Increased Availability of Modern Weaponry

To sweeten the payoff to a threshold state which can be persuaded not to go nuclear, the United States could be prepared to offer increased amounts of precision-guided munitions and other types of sophisticated conventional arms. Admittedly, the chances for success of the measure are low. Conventional weapons, regardless of

how modern, have neither the deterrent value nor the aura of prestige attached to atomic weaponry. This measure may bring time, but is unlikely to ultimately satisfy a country interested in nuclear weapons for deterrence or prestige purposes.[13]

Inducement to Sign the NPT

In past negotiations over American nuclear reactor offers to India and Egypt, the United States has not insisted on Israel's or Egypt's signing or ratifying the NPT as a condition for the receipt of the proffered reactors. Undoubtedly, the US offer of nuclear assistance to the two nations would be seen in a more understanding light by other states in the region and elsewhere if Israeli and Egyptian adherence to the treaty could be achieved in the process. Numerous countries throughout the world are waiting to see whether the world will have many or few nuclear powers. India's nuclear test suggests many; a nuclear-free Middle East would suggest few.[14] While the United States thus far has not used the reactor offers as a bargaining tool, such action might usefully be considered as a supplement to the other measures suggested above.

Provision of Conventional Arms

In the case of Israel, where the nuclear option would appear to be motivated primarily as an offset to possible Arab quantitative conventional arms superiority, continuing, large-scale transfers of arms might serve to assuage such fears and minimize the possibility of seeking a nuclear option. This approach, however, is ripe with dilemmas for arms suppliers. As an example, modern fighter bombers could be made available to equip the recipient with the most effective means of responding to a threat of attack. Such aircraft, however, may also be nuclear-capable, even if rigged with makeshift bomb racks. In addition, it would not seem simple to ascertain whether such modern equipment might even encourage aggressive behavior on the recipient's part. Also, the nuclear option could serve as an ideal strategy for acquiring equipment supplier states might otherwise be reluctant to provide. All in all, however, a continuing provision of conventional arms could be instrumental in helping to dissuade a recipient from going nuclear, and could concurrently encourage the adoption of other nuclear control measures discussed in this section.[15]

Regional No-First-Use of Nuclear Weapons Pledge

Such a declaratory measure by one or more states in a region would impart a significant symbolic acknowledgement that atomic arms are illegitimate weapons of war, such as chemical or bacteriological weapons. To offer maximum credibility, such a pledge would have to be made in coordination with an augmentation of conventional arms capability so as to signal a specific second-use intention for nuclear weapons, if possessed by the country. A no-first-use pledge, if appropriately presented and implemented, would possess substantial psychological and political appeal. Unfortunately, in today's world, a "pariah" state most vulnerable to attack, such as Israel, would likely prove most reluctant to issue such a declaration, since such a state faces perhaps the most serious security threat and seems otherwise incapable of devising an effective substitute for nuclear arms.[16]

Safeguards

Despite the fact that IAEA safeguards are not capable of averting a long-term potential of building nuclear arms, they can do much to provide reasonable assurances of deterring diversionary activities over the short run. The existing safeguards of the IAEA are based on a process of accounting for nuclear material and providing early detection of diversion. They are not intended to prevent diversion, nor can they assure detection of all possibilities of diversion. At the same time, given the progress made in detection procedures in relation to the characteristics of the nuclear fuel cycle, IAEA safeguards do constitute a reasonable and useful instrument in a nonproliferation strategy.[17]

REDUCING THE PRESTIGE OF NUCLEAR WEAPONS IN WORLD POLITICS

Although it would appear that little can be done to diminish the actual significance of nuclear weapons in global power relationships, perhaps steps can be taken to minimize the prestige and symbolic importace of atomic weapons in international politics. Such measures would include: broadening the membership of significant international groups to include more nonnuclear states; agreement on a SALT treaty; conclusion of a comprehensive test ban agreement; and a nonuse declaration with respect to nonnuclear states. To the

extent that disputes involving nuclear powers can be reconciled without resorting to nuclear saber-rattling, the perceived importance of nuclear weapons will be diminished.[18]

Strengthening the International Behavioral Norm

Strengthening the norms of international behavior which prescribe the acquisition of atomic weaponry may be important in the internal debates of a state considering a nuclear option. Crucial to the maintenance of these inhibitions is the NPT system, the IAEA, and related safeguards. Additionally, any action or statement of individual states or organizations that tends to inhibit pronuclear proclivities would be useful and welcomed. Eliminating any distinction between peaceful and military nuclear explosives also would be of use in extending the taboo of nuclear use to nuclear acquisition, as would an appropriate Security Council or General Assembly resolution viewing the acquisition of a weapons capability as a "serious threat to peace and security" which would require consultation against possible action.[19]

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CHAPTER 7

IMPLICATIONS OF A NUCLEAR MIDDLE EAST FOR THE SUPERPOWERS

PROLIFERATION AND SUPERPOWER INTERACTION

In all cases of crisis and conflict between the United States and Soviet Union thus far, the outcome or culmination has been resolved short of the interaction of forces or the outbreak of hostilities. The characteristics of extreme caution on the part of the superpowers in any mutual direct cases is not bound to change. It is important to ask however, whether the injection of a nuclear capability in the Middle East has the potential of new implications or otherwise changing the consequences of another Middle East crisis for superpower relations. More particularly, would a crisis involving proliferation in the Middle East induce even greater superpower caution or would the stakes likely be altered to induce an escalation of US-Soviet involvement?[1]

A basic question regarding superpower interaction concerns the risks or opportunities for cooperation in the face of proliferation. Under such conditions, an ongoing, well-established dialogue between Moscow and Washington would be invaluable and essential. The scenario imediately suggests that the United States genuinely attempt to understand where Soviet sensibilities and sensitivities lie on this issue.[2] In the event of an announced Israeli nuclear capability, for example, it would appear vital for the superpowers to maintain a regular, ongoing strategic dialogue in which all relevant political-strategic issues could be painstakingly explored, rather than to confront a variety of unknown, unilateral Soviet moves. The objective would be to fine-tune the actions which each side feels it must take to protect its own interests, while keeping such moves from posing threats to the other side.

Accordingly, an established dialogue could usefully treat a number of critical issues, including possible changes in the type and quantity of arms transfers, the basing of forward-deployed units, or treaty commitments. It may well happen that developments in nuclear proliferation could induce superpower cooperation in areas of common interest, including an exchange of intelligence information.[1]

Superpower cooperation in the Nuclear Suppliers Group demonstrates that concerted US-Soviet action regarding nonproliferation is feasible. Certainly both countries share a common interest in avoiding issues that result in confrontations. Building on this realization, the United States might find it useful to tap Soviet thinking in this area where it parallels our own, rather than concentrating on confronting Soviet positions where they diverge from ours.[4] Perhaps the most formidable challenge for effective action would arise from the likelihood that since the initial nuclear threat would come from one side or the other in the Middle East, counterpressure on the part of the country's superpower patron could most usefully offset or nullify the threat. A potentially dangerous alternative to such unilateral pressure would be threats from the other superpower to provide its protege with atomic weapons to counter those of the initial proliferator, a development which would be are more likely to aggravate, than alleviate, the proliferation.[5]

Indeed, with regard to possible joint sanctions by the superpowers, the latter have not been able to develop an agreed position or otherwise make arrangements for *bilateral* consultations concerning proliferation problems. When India detonated her device, Moscow issued no apparent condemnation at all. It was widely perceived that Moscow viewed a nuclear-capable India as useful in constraining Chinese actions.

If it were possible to devise an effective response by the superpowers to a proliferation event, such action could serve to restrain a nuclear threshold country. Some form of direct leverage would probably be most effective with countries dependent on one of the superpowers for military or economic assistance.

The present position of the superpowers with reference to nonnuclear weapons states would be more acceptable and understandable to the latter if some joint US-Soviet actions could be prearranged for implementation if a nuclear weapon were used or brandished by a threshold state. The existing US-Soviet "hotline"

could be invaluable in such a contingency. It remains critical for the United States and Soviet Union to maintain the "nuclear truce" because of the imponderables which could arise in the diplomatic, political, and military spheres in the event the truce were broken. A most useful bulwark against proliferation would evolve from (1) the joint recognition by the superpowers that they cannot afford to have another state break the nuclear truce and (2) the announcement by the superpowers that joint plans exist to counteract such a contingency.[6]

GUARANTEES BY THE SUPERPOWERS

As has been mentioned above, nonnuclear states may be justifiably concerned over the consequences of an attack by a nuclear-capable state. The former may concomitantly fear that a nuclear-armed adversary, relying on the preventive effort of its atomic weaponry to limit or constrain any conventional military response on the part of a threatened state, might initiate a conventional attack.

While the United States recognizes the validity of such concerns on the part of potentially threatened countries, it also recognizes the impracticality or infeasibility of inducing these countries to enter into mutual alliances or of making hard and fast commitments to their defense. As an interim measure, Washington has sought to assure their survival, while dissuading them from going nuclear.[7]

Thus far, statements by the superpowers regarding nuclear guarantees have provided rather general, and not specific, guarantees to nonnuclear countries threatened by nuclear states. The only joint guarantee thus far extended by the Soviet Union, the United Kingdom, and the United States has been that in conjunction with the NPT. The guarantee, in the first place, applies only to parties to the treaty. Secondly, it implies that assistance will be rendered only if the three aforementioned nuclear powers which have signed the treaty act jointly. Finally, the guarantee stipulates that assistance will only be provided through the UN Security Council, where, of course, each of the nuclear powers has a veto. For these reasons countries in the Middle East may feel more reassured by working toward their own nuclear capabilities, rather than relying on the "international community" to act in their support.

The above factors notwithstanding, the existing commitments extended in connection with the NPT might be more reassuring were it not for two other problems. First and most obvious is the possibility

that the guaranteeing nuclear powers may not see eye to eye on either the nature of a problem or on the actions to be implemented, particularly if the problem concerns one of the proteges of a nuclear power. Secondly, the collective guarantee pertains only to *nuclear* aggression or threat of aggression—leaving unaffected the possibility of a nuclear state using only *conventional* armaments in operations or threats—against a nonnuclear country.

Given such ambiguities and gaps in existing "guarantees," it may prove extraordinarily difficult to convince a Middle East state that its security can be ensured by any means other than an indigenous nuclear capability. Therefore, if the superpowers are genuinely concerned with potential proliferation in the Middle East (and other regions), they may have to entertain alternative ways of assuaging the security concerns of nuclear threshold states. Indeed, a consequence of *not* doing so would be the real possibility that the United States and Soviet Union would be held hostages to an Israeli nuclear weapon as much or more than those Arab states directly threatened by Israel.

A suggested approach would be a joint US-Soviet understanding as to the measures each country is prepared to take in connection with implementing a nuclear guarantee. As a start, the United States and the Soviets might agree to forego certain actions in a crisis which might have the effect of appearing provocative to the other side. This might include the deployment of US nuclear-capable forces within given areas or within a certain distance of the Soviet border. On the other hand, prearranged understandings might be secured for other actions, such as the deployment of air defense units to a certain area where such actions are essential for success of the mission itself or for securing Soviet cooperation in related moves. Such understandings would optimally cover the types of threats to be dealt with, the nature of actions contemplated, and the extent to which the other side would support or acquiesce in such actions.

Whether the superpowers are prepared to collaborate in any such joint action at the moment is questionable. It is clear that neither superpower has so far demonstrated any awareness that it may, in the interests of averting proliferation, be required to intervene against a client state in certain circumstances. As Washington and Moscow stand ready to actively pursue policies of nonproliferation, each must fully and clearly understand the limits of permissible ac-

tions tolerable in the world today, and both must cooperate in maintaining those limits for themselves and the world.

THE FUTURE

The United States, in conjunction with the Soviet Union, might contemplate a security guarantee designed to include all the nations of the Middle East. Under the provisions of such an arrangement, perhaps built around a nuclear-free zone, Israel and the Arab states would pledge not to develop or acquire nuclear weapons, and the superpowers in turn would guarantee all states in the Middle East against nuclear attack.[8] A variation on this theme might be a possible joint approach to establish a "nuclear technology-free zone" encompassing a subregion of several specific countries.[9] This is not to gainsay all of the formidable obstacles associated with such measures, both with respect to security arrangements in the Middle East, as well as to cooperation with the Soviet Union. But current trends in both areas, discouraging as they may be, need not be accepted as inevitable destiny. The potential consequences of a nuclearized Middle East justify unceasing efforts at working toward an improved climate for cooperation—sustained by hopes for a diplomatic breakthrough—with the Soviets in that volatile area of the world. Should, however, a nuclear Middle East become a reality, despite all good efforts of the superpowers and other parties concerned, superpower diplomatic cooperation will be more critical than ever before in containing the danger.

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